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OBESITY: AETIOLOGY AND METABOLISM*

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[ABRIDGED]

By obesity is meant an excessive accumulation of depot fat in the storage areas of the body. What constitutes excess will depend upon the point of view. The physician is called upon to regard obesity as a disfigurement, as a disease, or as a "sign." The aesthetic criteria of obesity may be determined by individual taste, or even by the dictates of fashion, but there comes a point at which the deposition of fat impairs functional activity and gives rise to symptoms, so that a person may be said to be too fat if the adiposity results in distress or discomfort of any kind, impairs the sense of well-being, or diminishes the capacity to enjoy life. Ultimately, by embarrassing the heart and respiration and diminishing the resistance to disease it may be a menace to life itself. Even where it does not itself produce any deleterious results, obesity may be a feature of various disorders, some of which may shorten life. The prognosis will depend upon the disease with which the obesity is associated.

The correlation between obesity and the expectation of life is provided by insurance tables which indicate that, when a very large number of individuals taken at random are examined, the expectation of life is diminished among those whose weight exceeds by a certain percentage the mean of those individuals of the same height, age, and sex who have passed as first-class lives. It may be doubted, however, whether it is justifiable to assume that weight should increase with increasing age, as the insurance tables indicate.

The tables and formulae which have been constructed furnish a standard of normality rather than a criterion of disease, but a more accurate measure of normality might be obtained by selecting groups of individuals according to body build, instead of measuring a large number of individuals taken at random. If this were done many persons would appear less abnormal than when referred to ordinary standards. The "correct" weight for an individual should in some degree be related to the physical type to which he belongs. If this were more widely realized many people would avoid ill-health and privation through ill-advised attempts to make their bodily configuration conform to some general standard, whether derived from ideal weight formulae or prescribed by fashion.

The Sources of Fat

The depot fat of the body may be derived from all three proximate principles of food. Fat is first broken down in the intestine into fatty acids, which form soaps, and glycerol, but in the process of absorption through the intestinal wall these are again synthesized into fat. Fat in food, however, is not the only or chief source of fat of the tissues. Carbohydrate, which is readily convertible into fat, and furnishes about two-thirds of the energy of an ordinary mixed diet, is probably the main source of body fat.

Protein may likewise be a source of body fat in certain conditions, though it is doubtful to what extent this process occurs normally. Probably when fat formation from protein occurs it is indirectly through the conversion of the glucogenic amino-acids into carbohydrate, which in turn is converted into fat. It may be that in the normal organism triose formed in the course of intermediary metabolism from three carbon atom glucogenic amino-acids does not readily condense directly to form glucose, but is either rapidly oxidized or converted into glycogen. In these circumstances it is only indirectly through glycogen that protein would form glucose and fatty acid. A reciprocal relationship appears to exist between glycogen and fat deposition in the organism. In general, conditions which lead to a deposition of glycogen in the liver also lead to an increased deposition of fat in the fat depots and a simultaneous diminution in liver fat. Conversely, those conditions which cause a fall in liver glycogen also tend to the mobilization of fat in the fat depots and an increase of liver fat.

Before depot fat is mobilized it is probably broken down into fatty acid and glycerol, to be again resynthesized into neutral fat in the blood, but little is known of the mechanism of this process. The exact part—probably an important one—played by the liver in fat metabolism is uncertain, and some doubt has lately been cast upon the hypothesis that it is concerned with converting the mobilized fat into a more readily oxidizable form, as by the introduction of double linkages into the fatty acid molecule or the building up of fatty acid molecules into complex phospholipides such as lecithin.

By the law of conservation of energy, if more energy is taken into the body than is consumed the excess foodstuff must be stored, and as the capacity of the body to store protein and carbohydrate is limited the excess is chiefly stored in the form of fat. Owing to the high fuel value of fat, energy can be stored in smaller bulk in this form than in any other. Conversely, if the consumption of energy by the body is greater than the amount supplied in the food, the body draws upon its stores of energy to make good the deficiency. The carbohydrate stores are most readily available, but, having a limited capacity, are quickly depleted, after which the depot fat is drawn upon, and, finally, the body protein tends to break down. It is reasonable to suppose that obesity would result whenever there was long-continued excess of intake over output of energy, but the question needs close examination.

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Energy Requirements of the Body

The energy requirement of the body is the amount of energy necessary to cover the basal metabolism, bodily activity, and the specific dynamic action of food. The basal metabolism is the amount of energy consumed by the organism when at complete rest and in the post-absorptive condition—that is, at least fourteen hours after the last meal. It is proportional to body surface, not to body weight ; therefore the latter is not a reliable guide to caloric requirements, especially in very thin or very obese persons. To double the weight, for example, would not be to double the body surface or the basal metabolism. As for the energy required for bodily activity, a rough approximation to the number of calories to be allowed might be obtained by taking the average starvation metabolism for a person engaged in a certain kind of activity and subtracting from that value the figure for basal metabolism.

The specific dynamic action is the term used to describe the stimulating action of food upon metabolism. It is due to a drug-like effect upon cellular activity exerted by certain chemical substances formed in the intermediary metabolic process. Protein, which exhibits this action in the highest degree, causes a rise in metabolism equivalent to 17 per cent. of the caloric value of the food, and in the case of carbohydrate the rise is 9 per cent., and of fat, 2½ per cent.

In rough summary it may be said that the total daily caloric requirements for an individual of 70 kg. weight, 170 cm. height, 24 years of age, and doing light work, would be distributed as follows:

Basal metabolism ...	...	1,706 calories
Activity	...	534 ,,
Specific dynamic action	...	285 ,,
Total ...	...	2,525 ,,

This amounts to approximately 36 calories per kg. for twenty-four hours—the amount of energy in the food required for caloric equilibrium.

To strike an energy " balance sheet," the only item on the " income " side is food. The intake of food in most animal species is regulated by the proper correlation between appetite and physiological need, but in the human subject this correlation is apt to be upset by the numerous social and other inducements to excessive consumption. The tendency to routine in human society also leads to the persistence of eating habits once acquired, and while such habits may have been physiological at one period of life, they may cease to be so with altered activity, particularly with advancing years. It is not to be supposed, however, that the consumption of large quantities of food by obese persons is always to be attributed to such causes. In some cases it may be a response to a physiological need, especially in cases with a high carbohydrate tolerance in which excessive hunger results from hypoglycaemia, often accompanied by a specific craving for carbohydrate. Carbohydrate is cheaper than either protein or fat, more appetizing than the latter, and can be given in the concentrated form of saccharose or glucose, with the additional property of sweetness to render it tempting. Mechanical work can be performed more efficiently upon it than upon either protein or fat, with consequent saving of calories.

Food intake is by far the most important single factor capable of disturbing the energy balance. Many obese persons claim to be small eaters ; it is a claim always to be accepted with caution, but undoubtedly many obese persons do maintain their weight on diets well below the average, and rapidly put on weight on diets which fail to cause increased fat deposition in other persons.

Expenditure Side of the Energy "Balance Sheet"

On the debit side of the " balance sheet " the factor of greatest magnitude is the basal metabolism. It might, therefore, be anticipated that changes in the basal metabolism would be of great significance, but actual observation shows that while in a certain percentage of cases the basal metabolism is lowered, in the majority it is normal, and in a small number of obese persons actually above the normal range. The finding of even a normal basal metabolism in very obese individuals points to an actual increase in the metabolism of the active tissues, since a large portion of the mass of the body is made up of comparatively inert fatty tissue. The presence of obesity, therefore, is compatible with lowered, normal, or increased basal metabolism, and conversely a basal metabolic rate well below the normal may be encountered in persons who are not obese.

Various factors influence the metabolic rate at rest. Among these are drugs, such as thyroid and dinitrophenol, and also the toxins of disease, endogenous and exogenous. The metabolic rate is influenced by emotion, especially worry, and in these circumstances weight may be lost. Since absence of emotion saves calories it might be expected that phlegmatic persons would be more prone to obesity. Contrary to popular impression, the majority of obese individuals consider themselves excitable rather than placid ; but this excitability may be cortical rather than vegetative in origin. Exposure to external cold leads reflexly to increased metabolism and heat production to compensate for the heat withdrawn from the body, but the role of climate is made less important as a factor influencing the metabolic rate at rest by the wearing of clothing and the use of artificial heating, the effect of which is to prevent any great change in the immediate environment of the body.

There is no evidence that obesity is commoner in warm than in cold or very hot climates, nor that the wearing of excessive clothing is commoner among obese persons. That changes in external temperature are not without influence, in spite of clothing, is suggested by the fact that persons of fixed habits in regard to food and exercise tend to become lighter in winter than in summer. The heat mechanism is disordered in obesity, heat loss by radiation being diminished, though this is compensated to some extent by increased loss of evaporation (excessive sweating). Finally, among the factors influencing metabolic rate at rest may be placed affections of the circulatory and respiratory organs, in which increased work performed by the muscles of respiration or by the heart itself may lead to a definite increase in energy consumption, sometimes amounting to about 50 per cent. of the basal metabolism.

Exercise

The energy supplied in food may be consumed in mechanical work, but compared with that required in metabolism the amount of food converted into mechanical work constitutes a relatively small proportion of total energy consumption. In the example quoted above, for a man weighing 70 kg. and doing light work, it would be only a little over one-third of the basal metabolism. The energy required for work only approximates to that for the basal metabolism in individuals engaged on labour of a very heavy kind. It has been found experimentally that an individual walking at three miles an hour along a level road uses 0.0005 calorie per horizontal kilogram-metre, so that a man weighing 70 kg. would in an hour's walk covering two and a half miles require only 140 calories, or approximately the amount of energy contained in a slice of bread.

There is no evidence that the mechanical efficiency of the body is greater in the obese than in the normal. In cases of marked obesity the mechanical efficiency is actually decreased. These facts indicate that in the treatment of obesity it is much easier to produce a negative caloric balance by reducing the food intake than by increasing the amount of exercise. Apart from this, there may be disadvantages in prescribing exercise during a reduction cure, owing to the stimulation of appetite, and, of course, strenuous exercise is definitely contraindicated when there is circulatory embarrassment.

Leaving out of account the basal metabolism, which is usually normal in obesity, exercise comes next to food intake in order of magnitude and variability among the factors capable of disturbing the energy balance. Obesity is commoner among persons of sluggish habits and sedentary occupation. Many persons date their obesity from a period of enforced rest, such as an illness or pregnancy, and the greater incidence of obesity in the female sex may be partly attributable to these factors. On the other hand, a great many obese people are very active in their habits; inactivity is often only a late effect of obesity. The energy consumed as a result of specific dynamic action of food constitutes a smaller fraction of the total energy involved than that represented by any of the factors hitherto considered. The evidence with regard to any alteration in such action in obesity is at present unsatisfactory, but, such as it is, it seems to point to the action being diminished in many cases.

Over-nutrition and "Luxus" Consumption

According to the principle enunciated by Pflüger, energy consumption is determined, not by the supply of energy, but by the demands of the tissues, any excess of intake over requirements being immediately stored, chiefly as fat. If this were true, any continued, even though slight, excess of intake over requirement would eventually result in obesity. It is a matter of common observation, however, that there are people who are big eaters and who, in spite of a sedentary life, fail to increase in weight, while others who take only a fraction of the amount of food and lead a more active life become fatter. This suggests that the problem of obesity is not just one of adjustment of the energy balance in terms of the estimated requirements. Failure to lose weight on diets much below the estimated requirements or even on a basal caloric intake without complete rest is usually to be explained by water retention, lowered metabolism, or a lack of correspondence between estimated and actual energy requirements. Water retention may result from starvation, but in some cases of obesity it is so marked as to suggest some involvement of the neuro-hypophyseal mechanism regulating water metabolism. Lack of thyroid secretion is also conducive to water retention.

It goes without saying that if the energy intake is less than the energy consumption there will be a loss of energy-yielding tissue. In the presence of a negative energy balance every individual, obese or otherwise, will lose tissue substance. The fundamental problem in obesity is not so much what occurs when less food than necessary to meet the energy requirements is ingested, but what happens to the food taken in excess of the caloric requirements. The body may deal with the excess by limitation of absorption, elimination, increased mechanical work, combustion ("luxus" or excess consumption), or storage. There is no evidence that the first two of these play any important part, nor is there any evidence that an intake of food above the requirements at the moment leads instinctively to a subsequent increase in bodily activity. Storage, of course, is a well-established method; the question of luxus consumption requires further consideration.

It is a noteworthy fact that body weight normally tends to remain remarkably constant in spite of wide fluctuations in food intake and bodily activity. The body would appear to have some means of automatically regulating its weight. One of the means by which it adapts itself to under-nutrition is a lowering of the metabolism, so that it would not be surprising if it responded to over-nutrition by an increase in metabolism. Conclusive proof of the existence of luxus consumption in man is not yet forthcoming, but the available evidence points strongly in that direction. As to the bearing of this hypothesis upon the problem of obesity, the first question it raises concerns the definition of over-feeding. From one point of view over-feeding is an excess of food intake over energy requirements. In this sense most people over-eat. But if over-feeding is to be regarded as an intake of food in excess of that which can be dealt with normally by the mechanism regulating the standard of body weight, then fewer people may be said to over-eat. If luxus consumption is involved in the mechanism it follows that its normal limits must be ascertained before a satisfactory definition of over-eating can be given, and this can only be determined after examining a large number of individuals. At present we can only surmise the amount of luxus consumption which might be expected to occur normally. The average intake of food per head of population is approximately 3,400 calories (Atwater), and the average physiological requirement is only 2,500 to 3,000 calories, so that there is an excess of 400 to 900 calories per head, yet only a small proportion of the population is made up of obese persons.

Since luxus consumption, as observed in the dog, varies with the food intake, increasing up to a certain point as the food intake is increased, it would constitute an important protection against obesity. Variations in luxus consumption would explain the differences found in individuals, from those at one end of the scale who remain lean on a very large food intake, and those at the other who tend to put on weight in the presence of even slight excess. From these and other considerations it would appear that the various factors discussed under the heading of energy requirements and energy balance ought to be viewed in their possible relation to luxus consumption. Variations in these factors would be significant in regard to the genesis of obesity only in so far as they resulted in a load being thrown upon luxus consumption beyond the capacity of the mechanism to deal with adequately.

Intermediary Metabolism

A diminution in luxus consumption might be brought about primarily by decreased burning of the excess food or by increased storage. Deficient combustion seems to be a factor only in the small group of obesities associated with a lowered metabolic rate, and especially with diminished thyroid activity. Removal of the gonads is said not to reduce luxus consumption, but no more does it produce obesity in most animals. In the human subject the tendency to obesity after ablation of the gonads increases with advancing years, but this may be due to failure of compensatory changes in the thyroid and pituitary glands. There is no evidence that the obese exhibit any specific inability to burn fat, whether the fat is administered or derived from the fat depots during starvation; nor that the liver, which is supposed to be concerned with converting fat into a form suitable for oxidation, is at fault. There is likewise no evidence of any specific inability to burn carbohydrate.

There remains the second alternative, that the diminution in luxus consumption may be brought about by increased storage. This might be due to some abnormality referable to the fatty tissues themselves, or it might be caused by some disorder of intermediary meta-

bolism leading to increased formation of fat from other foodstuffs. Inability to break down and mobilize stored fat would result in a progressive heaping up of fat in the depots, but this is not observed in obesity. If it could be shown that the essential peculiarity of metabolism in obesity was an excessive conversion of carbohydrate into fat a relatively simple explanation of many of the facts about the disease would be forthcoming. It is difficult, however, to obtain decisive experimental evidence for or against this hypothesis. There is no evidence that the ingestion of carbohydrate causes a more rapid or pronounced rise in the respiratory quotient than in normal persons, and in any event the respiratory quotient only represents a dynamic equilibrium, in which many different kinds of reaction having opposing effects are concerned, so that it cannot be regarded as a reliable guide to what is occurring.

The importance of the interrelationship of carbohydrate and fat metabolism in obesity is further brought out when the role of the endocrine glands and nervous system is considered. Although there are still important gaps in knowledge, the evidence seems to indicate that lesions or functional disturbances of the endocrine glands and nervous system of a kind leading to obesity lead also to the deposition of glycogen in the liver. In this respect the endocrine obesities would come into line with obesities due to overfeeding. The administration of insulin along with adequate supplies of carbohydrate leads to the deposition of glycogen in the liver, and this has also been used as a means of fattening people. Basophil adenomata of the pituitary gland give rise to marked obesity. The more important features of pituitary basophilism, including obesity, though not hypertension, have been reproduced experimentally in the dog by the injection of pituitary extracts rich in gonadotropic hormones (Thompson and Cushing), and one of the most striking results of this administration was the deposition of an enormous amount of glycogen in the liver cells. A very similar syndrome may result from tumours of the adrenal and thymus glands, possibly with similar effects upon glycogen formation. Partial destruction of the anterior lobe of the pituitary gland in young animals may result in obesity (Cushing), and small tumours confined to the sella turcica, without any possibility of their pressing upon the tuber cinereum, give rise to adiposity and an increased sugar tolerance. The obesity resulting from such lesions, unlike that of pituitary basophilism, is probably to be attributed to deficient secretions (of diabetogenic and thyrotropic hormones?)

Little is known regarding the obesity which sometimes follows ablation of the gonads, but it is possible that it may be due to secondary changes occurring in other endocrine glands, especially the thyroid and pituitary. It has recently been shown that removal of the ovaries in the rat increased the glycogen content of the liver (Gullick, Samuels, and Deuel).

Experimental lesions, tumours, and inflammatory disease of the hypothalamus sometimes result in obesity. There are some experimental data suggesting that lesions in this situation may also lead to increased glycogen deposition in the liver (Foster and Benninghoven). A considerable body of evidence has now been accumulated to show that the hypothalamus has physiological and anatomical connexions with the autonomic nervous system. In view of the existence of such mechanisms it would be easy to understand how lesions or functional disorders in the hypothalamus could influence carbohydrate metabolism through the autonomic nervous system. When the disorder was such as to give rise to a predominance of anabolic (parasympathetic) over katabolic (sympathetic) functions, glycogen storage and obesity might result. The hypothalamus might also influence carbohydrate and fat metabolism through its nerve supply to the pituitary and possibly to other endocrine glands.

The processes of glycogen formation and the conversion of carbohydrate into fat seem to be linked together in some way, but the exact nature of the underlying mechanism responsible for this interconnexion is unknown. Accumulation of glycogen in the liver, however, does not invariably lead to obesity, for if the glycogen is excessively resistant to mobilization, as in von Gierke's disease, the tissues may be starved.

Sugar Tolerance and Obesity

Examination of the sugar tolerance has been employed as a means of investigating the metabolism in obesity. The carbohydrate tolerance in obesity may be normal, increased, or diminished. An increased sugar tolerance might result from increased functional activity of the islet tissue of the pancreas or from diminished secretion of hormones which antagonize insulin, such as thyroxine and certain pituitary hormones; or, again, it might be due to certain lesions of the hypothalamus in situations similar to those which have been shown experimentally by Davis to be capable of suppressing the hyperglycaemia and glycosuria following pancreatectomy. In this connexion the importance of quantitative relationships is to be noted. The administration of excessive quantities of insulin sufficient to produce hypoglycaemia, or the administration of insulin without an adequate supply of carbohydrate, leads to a disappearance of glycogen from the liver and a loss in weight. That may be one reason why hyperinsulinism associated with pancreatic adenomata is not accompanied by obesity. Similarly the emaciation which is found in complete, as contrasted with partial, destructive lesions of the pituitary, as in Simmond's disease (hypophyseal cachexia), may in part be due to chronic hypoglycaemia resulting from lack of the diabetogenic and gonadotropic hormones. In keeping with this is the finding that after complete experimental removal of the anterior lobe of the pituitary the liver glycogen is not increased, and that which remains appears to be very resistant to mobilization (Corkhill, Marks, and White).

Some forms of obesity, on the other hand, are associated with a diminished carbohydrate tolerance often resulting in glycosuria. It is customary to interpret the diminished sugar tolerance as an exhaustion phenomenon due to prolonged overtaxing of the islets of Langerhans and/or to regard the obesity and glycosuria as the result of a common cause—namely, over-eating. This may be the sequence of cause and effect in many instances, but there are many reasons for doubting the validity of this interpretation in all. The most important of these are the results obtained by Thompson and Cushing in their work upon experimental pituitary basophilism, which provide an example of glycogen deposition, obesity, and diminished carbohydrate tolerance produced in a comparatively short time as a result of the administration of pituitary gonadotropic hormones. Evidence is therefore gradually accumulating which points to some forms of glycosuria, particularly those associated with obesity, being due to causes outside the pancreas and possibly referable to functional disturbances of endocrine activity similar to those which occur in pituitary basophilism. But it would not be justifiable to refer all cases of glycosuria associated with obesity to extrapancreatic causes.

The available evidence therefore suggests that the essential change in intermediary metabolism underlying a large group of obesities is to be traced to a disturbance of hepatic function, whereby glycogen is laid down and carbohydrate is converted into fat with excessive ease. This may be

brought about by disturbances in the control of hepatic function due to change in functional activity of one of the endocrine glands, with or without concomitant or compensatory changes in other glands or even in the same gland ; or it may be due to changes in the central nervous system. In a very large proportion of cases of obesity, however, there is absence of definite collateral evidence of disease of an endocrine gland or of focal disease of the nervous sysem. It might therefore be supposed that in such cases the disorder was one of the neuro-endocrine system as a whole, whereby automatic control of constancy of body weight became thrown out of gear. At the same time it is difficult to conceive of a specific anomaly of metabolism affecting all parts of such a complicated mechanism simultaneously, in the absence of some central co-ordinating mechanism. Such a mechanism may perhaps be found in the metabolic centres in the hypothalamic region of the brain or in the neuro-hypophyseal mechanism considered as a functional unit. A functional derangement of this mechanism may be at the root of many cases of obesity—perhaps the majority. Obesity of this variety would be classified as neuro-endocrine.

Distribution of Fat

Can the origin of an obesity be diagnosed from the distribution of fat? An apparently formidable array of evidence has been brought forward supporting this possibility, but I would plead for a more critical attitude. If we confine our attention to the adipose tissue alone, and leave out of consideration all such concomitant phenomena as changes in skeleton, ligaments, skin and its appendages, subcutaneous tissues, genitalia, and so forth, can we be quite certain that the fat is distributed in a characteristic fashion according to the cause of the obesity? If this is not certain, then, in the absence of these concomitant changes, the configuration of the patient would not provide any certain clue to the specific origin of the condition. On the other hand, the physiological variations in the distribution of fat appear to be of so similar a character to those met with in disease that the possibility cannot be overlooked that the fatty tissues themselves, the inherited pattern of the fat depots, may to a large extent determine the distribution of fat in obesity from any cause. Even in obesities of known endocrine origin differences may occur in the distribution of fat in affections of the same gland, while the distribution may be very similar in diseases of different glands. The role of the fatty tissues is also probably of primary importance in another variety of obesity. There are some stout persons who live an active life, eat in moderation, and maintain a fairly constant body weight, but who exhibit no abnormal tendency to put on weight on a liberal diet and in whom no disorder of metabolism is detectable. In these the obesity appears to be structural and developmental rather than metabolic in origin. There seems no reason why the mass and distribution of the fatty tissues should not be determined by heredity, in much the same way as the size and structure of bones or the mass of muscles is so determined, granted, of course, modification by other factors.

The aetiology of obesity may be summed up in the classification of the condition as developmental, metabolic, or nutritional. Metabolic obesity may be endocrine, neurogenic, or neuro-endocrine in origin. The developmental group would be wholly hereditary, the nutritional group wholly acquired, while the metabolic group might be either hereditary or due to acquired disease. In all varieties such variables as food intake and exercise play a part, although in the nutritional group they are the primary factors ; while the influence of heredity is suggested by the fact that some 70 per cent. of the subjects of obesity have overweight parents.

TREATMENT OF MAMMARY CANCER*

BY

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The amputation after *x*-radiation of breasts affected with cancer has enabled us to make observations which, in the main, accord with those of other writers. Unfortunately, since it is not our custom to make a preliminary biopsy, it was not possible to compare conditions before and after irradiation ; and, since in growths not subjected to irradiation there is a wide variation in the amount and character of the fibrous tissue and of the small round-celled and plasma-celled infiltration, it was difficult to draw positive conclusions concerning the degree of induced change. There was also no opportunity for correlating the amount and character of the fibrous tissues in the dermis and glandular tissue with the time interval between irradiation and the operative removal of the breast.

Tissue Changes in Breasts Amputated after X-radiation

I am indebted to Dr. A. H. Tebbutt, who has had considerable experience in the histological examination of mammary cancer, for his opinions concerning the changes found in a limited number of breasts amputated after *x*-radiation. The non-malignant glandular tissue near to, and at some distance from, the growth showed remarkably little effect beyond an increase of the fibrous tissue in and around the lobules. Certainly the gland cells did not show the heteromorphism which was a conspicuous feature of the tumour cells lying at the same depth. Tebbutt did not find the vascular lesions playing the dominant part attributed to them by Pullinger and others. The most striking effect was a morphological change in the irradiated cancer cells and in their subsequent generations, the " formes monstreuses " of French writers. These changes were seen distributed not only throughout both the superficial and the deep parts of the growth, but also in the irradiated metastases in lymph glands. Thus there was not apparent that striking difference between the effects produced on the primary lesion and on the glandular metastases which we see in cervical cancer.

After irradiation the mammary cancer cells often showed a large nucleus, which at times was vacuolated, irregular in shape, lobulated, hyperchromatic, or had an irregular distribution of chromatin. At other times the nucleus was ill defined, pale, and vesicular. The cytoplasm was often abundant, but poorly defined from that of adjacent cells. It was frequently hazy, while both nucleus and cytoplasm stained a deep dirty red colour, as if cell death had taken place. Frank areas of necrosis were not conspicuous, and mitotic figures were rare. Some cells, however, did not show this gross heteromorphism, and it could not be said that the morphological changes described were necessarily indicative of a lethal effect, although the changes produced on cell life and mitosis were profound.

We must accept it as a fact in a discussion of the radiation treatment of mammary cancer that, apart from a few highly anaplastic and relatively infrequent types, the overwhelming majority of these widely differing growths do not possess the distinctive quality of radiosensitiveness in such a degree as to justify the prior expectation of a cure by these means. It might appear that the breast, by reason of its accessibility, would offer

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a peculiarly favourable opportunity for external irradiation, but, as we all know, the danger of injury to the underlying lung precludes the effective use of a frontal attack and makes tangential irradiation necessary. It is thus difficult or impossible, except with a protuberant breast, to achieve any considerable degree of cross-firing. The chief result obtained, then, is a reduction in the volume of the tumour, dependent either on the sensitiveness of certain elements or on the vascular changes induced. But this shrinking must not be allowed to give us the fleeting illusion of a cure. Not infrequently a period of apparent calm is succeeded by one of heightened activity. And any evaluation of the prolongation of life which may appear to have been obtained must be considered in the light of our knowledge of the natural duration of life in untreated breast cancer.

External Supplemented by Interstitial Irradiation

If, therefore, external irradiation alone is nearly always insufficient to control the primary growth, we must supplement it by the use of some form of interstitial technique. The amputated breast after such interstitial irradiation now shows a picture modified by the increase in absorbed radiation, by the secondary radiation, and possibly in addition by a low-grade sepsis. The areas of necrosis are usually more numerous, and there is a greater degree of fibrosis. But once again the complete sterilization of the growth, excepting for extremely small lesions, is very rarely if ever realized. The breast will tolerate extremely high doses of interstitial irradiation, but the task of distributing an effective cancer-destroying "dose" uniformly over the whole tumour-bearing area is impossible by means of seeds alone, and only with great difficulty fulfilled with radium needles or radium tubes containing radon. Even in the leisure of a laboratory the problem is not an easy one, and it is therefore highly optimistic to assume that we can solve it with any degree of certainty in an operating theatre faced with the variations in size and form of breasts and tumours.

It is, of course, always impossible to realize an equal and homogeneous irradiation by these means, but that is not an indispensable condition. What is essential is that we should satisfy the condition of delivering an adequate dose of irradiation to the utmost parts of the tumour; and this is an extremely difficult undertaking. Not that it is necessary directly to strike with death each individual cancer cell, for we have the stroma playing an important if subordinate part. Nevertheless, in the present state of our knowledge, our main object must always be to concentrate a direct attack on every accessible cancer cell with the maximal tolerated intensity. The idea that by creating a barrage of fibrous tissue around or across the path of a growth we can successfully oppose its march or circumscribe its action is entirely erroneous. The cancer cell that is not immediately or shortly destroyed will continue to threaten the security of the patient, and the associated fibrosis, when it is not the final expression of cure, merely frustrates the radiotherapist. Fibrous tissue for him is a degradation of normal tissue, and from it no defensive effort can be evoked. The patchwork of fibrous tissue and actively growing tumour cells is evidence either of faulty technique or of a resistant tumour, and in either case it is of evil omen.

DEFECTS OF THE INTERSTITIAL TECHNIQUE

Thus the defect of an interstitial technique when dealing with any but small areas is the risk of leaving a loop-hole in a widely flung net. The evil effects of adding sepsis to or of traumatizing the growth cannot be lightly disregarded. The surgical acumen of Keynes has made him realize the possible danger from introducing needles directly into the tumour, and this preoccupation further increases the difficulty of achieving a uniform and effective field. Unfortunately it is impossible to draw positive conclusions concerning the value of this method, because the statistics frequently concern patients in whom there has been no histological confirmation of the clinical diagnosis.

If the interstitial method of treating the primary lesion of the breast is one lacking in precision, its application to the treatment of secondaries in the axillary glands must be a still more speculative procedure. Finally, while the use of long tubes containing radon permits a readier adaptation to the requirements of a particular breast I cannot be convinced that in the treatment of a resistant cancer the biological effect from a petering dose of radiant energy can equal that obtained from the steady glow of radium element, although the sum total in units of energy may be the same. This method, however, which was first employed many years ago at the Memorial Hospital, New York, and which, with a higher filtration, has been adopted by Clendinnen and Kaye Scott in Melbourne, offers this advantage, that it is readily adaptable to the widely varying conditions with which we are confronted. It is, I believe, the best and most convenient way of supplementing the deep *x*-radiation in treating an inoperable cancer of the breast.

We can therefore make no valid claim in the treatment of an operable growth for the routine use of radiation therapy as a means of supplanting an operative procedure which, however mutilating, cannot be debited with any considerable mortality. The one positive contraindication for the practice of surgery is the rapidly growing, highly malignant carcinoma, above all when it occurs in association with pregnancy or during the puerperium, for the surgical intervention merely quickens the pace and extends the line of attack.

Radiation in Treatment of Metastases

In the treatment of metastases the superiority of radiation therapy is clearly defined, although the sum of its achievement is to be reckoned less in lives redeemed than in the relief of pain and the brief postponement of an inevitable end. Contrary to what we find in squamous carcinoma of the buccal cavity, where the primary growth, so often amenable to successful treatment by radiation therapy, gives rise to secondary deposits that are highly refractory, the metastases from the resistant types of neoplasms in the breast show a surprising sensitiveness. The reason for this I do not know; it cannot be explained merely by a change of tissue bed. Metastases in the skin are so sensitive as no longer to justify piecemeal surgical excision. The part of the surgeon must lie rather in the direction of prevention by a more judicious selection of the subjects suitable for operation and by the refinement of his surgical technique.

Secondaries in the supraclavicular region and in the neck usually disappear without difficulty under the influence of quite moderate doses of external irradiation. Not only can metastases in the vertebrae, and throughout the osseous system generally, be made to vanish, but in some instances a process of recalcification takes place. Spontaneous fractures have united. Whether osteoporosis alone is present or there is an associated osteoplastic process the relief of symptoms is such as to justify a description of the achievement as noteworthy. No matter whether they occur in the ribs, the sternum, the pelvis, or the long or cranial bones, at least a transitory benefit can be obtained.

The distant metastases which resist radiation are, first, those in the lungs and pleura, where the risk of injuring the sensitive healthy lung tissue hampers the radio-

therapist by restricting the dose. Secondly, in the cross spread of mammary cancer to the other breast radiation therapy is less effective than with skin metastases. Thirdly, the rare cerebral metastases, usually meningeal or meningo-cortical, do not yield to radiation, although the cranium is an ideal site for cross-firing ; in one of my patients, however, the relief of headache was complete. Lastly, metastases in the liver and other viscera are beyond the reach even of palliation.

Radiation in Combination with Radical Procedures

If the place of radiation therapy in the treatment of inoperable breast cancer and of the metastases cannot be challenged, its value as an auxiliary to the radical operation is still contested and its precise place in a combined plan of action not yet defined. The use of tubes of radium by Sampson Handley's method did nothing to improve the position, because it was grounded in errors of a physical order. The early extravagant claims made for the routine use of post-operative irradiation as a prophylactic against local recurrences were quickly found to have little justification in experience. In my opinion its scope and value are extremely limited, and with the more careful selection of the growths suitable for operation, and with the more restricted use of surgery, it will be less and less used.

At present the chief value of radiation is to be found in the after-treatment of patients in whom operation should not have been performed because of the extensive spread, or where the operative technique has been faulty by reason of the insufficient removal of skin or because of rough handling. The elementary mistake is still made of considering that the malignant activity is limited to the area of palpable or visible growth. Local recurrences will become rarer with a higher standard of surgical skill and judgement. If cancer cells are left behind in the operation area their destruction by external irradiation is no easy matter, since a frontal attack must be made on a flat surface and in a field where the arterial supply and the innervation have been gravely disturbed. We can neither deliver a large dose with safety nor expect with reason a beneficent response from the traumatized tissues. If normal tissue can be stimulated with radiant energy to resist cancer cell invasion it is not in circumstances such as these that we can elicit its best effort. If however, we do accept the theory that the resistance of normal tissues to cancer invasion can be so heightened, then we should admit that they can also be rendered more susceptible.

Experience has shown that it is not the surgeon alone who traumatizes healthy tissues ; the radiotherapist can fan to fierce activity the slow fire of a malignancy. We have all seen examples of sudden aggravation by means of ill-advised irradiation, although, happily, with riper knowledge the instances have become rare. With unskilled and inexperienced radiotherapists the risk of doing harm is greater than the likelihood of any increased insurance against local recurrence. This method of post-operative irradiation should therefore be reserved for those patients in whom at operation a more extensive cancer spread was discovered than had been beforehand suspected, and in whom operation might have been better avoided. The statistics quoted in support of it as a routine procedure are subject, like all statistics that deal with mammary cancer, to so many variable factors that we cannot accept them without further proof based on biological evidence.

THE CASE FOR PRE-OPERATIVE IRRADIATION

For pre-operative irradiation a much better case can be made out. On theoretical grounds alone, properly applied *x*-radiation, delivered two or three days before the operation, should render surgical intervention safer, because of the restraint put on a far-flung line of cancer invasion. The rationale of this method should be clearly appreciated. It is not expected to sterilize the growth, and so there is no purpose in waiting for the full tide of biological response. The radical operation is accepted as the essential part of treatment in certain selected cases. This preliminary irradiation is then designed merely to lessen the danger of scattering that must surely be inescapable with an extensive dissection. But the breast which has been deemed inoperable should always be considered inoperable. We must not be deceived by any reduction in volume or newly acquired mobility following the *x*-radiation. Intervention at this stage will merely hasten the process of intrathoracic spread and shorten the period of apparent cure.

Since there is no unity of structure or behaviour in mammary cancer there can be no uniformity of treatment. Our present aim should be in each case to look for guidance as to the best method from a consideration both of the morphological characters of the growth and of the clinical history. A biopsy may probably be made with comparative safety after preliminary irradiation, but we have not yet reached the stage where we feel justified in adopting this as a routine measure. The rapidly growing anaplastic carcinoma, on its history alone, should be shunned by the surgeon ; external radiotherapy offers the best chance of temporary relief. It would be illogical with such growths to ban surgery and to recommend a traumatizing interstitial technique, which in any event is not necessary. The adenocarcinoma of the breast can be reduced in volume but not cured by irradiation. On the other hand, it yields to the surgeon a high percentage of successes, even when the primary growth is extensive. The patient with a bleeding nipple should be irradiated and then submitted to surgical treatment. To treat her blindly with irradiation alone is unjustifiable, although the duct carcinoma is radio-sensitive, at least until it has infiltrated beyond the ducts. But surgery, too, does well here. Radiographic examination of the thorax should be a routine precautionary measure before any surgical procedure.

There is no present justification for the suppression of the radical operation as an important part in the treatment of mammary cancer in selected cases. In scirrhous carcinoma surgical means should be restricted to the early or slow-growing varieties ; the indications for operation in this cancer should be drawn closer in, otherwise there is a real danger that surgery may quicken the pace of the malignancy. It is unfair to thrust on the radiotherapist the thankless task of treatment in cases where an operation should never have been performed or where it has been unskilfully carried out. There would appear to be no virtue in irradiation as a preventive measure in the treatment of precancerous lesions of the breast.

The value of radiation treatment in mammary growths generally cannot, therefore, be rated as high as in some other neoplasms. But this new physical therapy has not been without beneficent influence on the practice of surgery. Its use has drawn attention to the mistake of considering mammary cancer merely in terms of its anatomical spread. On the other hand, there is a present danger that radiologists may envisage cure merely as an affair of " dose " estimated in physical units of energy. Radiotherapy is capable of improving the results obtained from surgery in operable cases and of bringing relief to patients before whom the surgeon is powerless. At the present stage of our knowledge the most that can be obtained from these local agents in the treatment of a generalizing disease must come from the sympathetic collaboration of medical men of different disciples working for a common end.

THE STRAIN OF SCHOOL LIFE ON GIRLS DURING THE EARLY MENSTRUAL PERIOD

BY

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The following is a condensed account of an inquiry, carried out at the request of an education authority, to determine the effect of the strain of school life on the physical welfare of girls during the somewhat critical period of the early menstrual years, with special reference to home lessons. Home lessons are almost universally condemned by parents, and as strenuously upheld by teachers, so it seems advisable to determine, if possible, the medical aspect of the question.

The subject of fitness is very complex, and is influenced by so many factors that it is extremely difficult to assign loss of physical or mental fitness to any one cause. Good health is so delicately balanced that in certain individuals a comparatively small mental worry or psychological disturbance may have a far-reaching effect on the physical welfare, and prepare the way for the onset of definite disease. If two people of apparently equal physical and mental fitness are given a certain task, requiring the expenditure of considerable energy, either physical or mental or both, one will complete the task with comparative ease and the other will fail. The successful one has something that the other lacks. This something may be called stamina or vital force.

Stamina and Sensitiveness

Stamina is influenced by heredity as well as by prenatal and post-natal conditions. The health of the parents, the character and suitability of the food, and the general hygienic conditions of the home, especially during the first few years of life, play an important part in determining physical fitness. A child brought up in a good home, surrounded by the love and care of kind and considerate parents, who exercise a wise discipline, is more likely to maintain sound health of body and mind than a child who lacks these advantages.

Children are very sensitive, and can be made unhappy by petty annoyances and rebuffs, and a child reared in an atmosphere of this kind is apt to be reserved and lacking in self-confidence, which will render the school life more difficult and trying. Again, a keen, over-anxious, rather sensitive child is apt to feel the strain of school life, but that in itself must not be regarded as proof that the school work is harder than it should be ; the fault may lie with the child rather than with the school. If the child is mentally dull or slow, as well as of an anxious and nervous disposition, the effect on the health is correspondingly greater. Girls of from 12½ to 14½ years of age have to contend with the added disturbing effect of commencing menstruation, which renders this period somewhat critical, as many influences, of which very little of a definite nature is known, are at work during this particular time, and those with an unstable nervous system are apt to suffer. It seems reasonable to suppose that during this period any extra strain and worry will influence the health of the child.

Comparison Between Boys and Girls

As compared with boys of approximately the same chronological age the examinations clearly demonstrated that the physical fitness of girls depreciated more during the school session. It is of interest to quote two passages from the report of the Consultative Committee on Differentiation of Curricula between the Sexes in Secondary Schools:

1. "There was evidence that girls are much less able to protect themselves against over-pressure than boys, who have, as a rule, a habit of healthy idleness, whereas girls are more conscientious." As one witness expressed it: "If you give a girl too much to do she breaks down ; if you give a boy too much to do he doesn't do it."

2. "It is now certain that physiological age bears no direct relation to chronological age. Anatomically girls are in advance of boys by six months at 5 years of age, and about one year at 15 years of age. There are material differences in the blood content—the percentage of haemoglobin is less in the female after puberty ; the male is better prepared for a more abundant liberation of energy with less exhaustion or fatigue."

These conclusions are very interesting, and, as will be shown later, they bear a close resemblance to those arrived at as the result of this inquiry. There can be little doubt that the mental development of some children, just as the physical development, is more advanced than in others. The precocious child is not necessarily, or even generally, possessed of a real intrinsic intellectual superiority, but has a mental development one or more years in advance, an advantage which is lost in later years and the precocious child finds its proper level. Some such explanation is necessary to show why so many of the more brilliant pupils fail to maintain the higher standard.

In this investigation an attempt was made to obtain information regarding all the factors which would be likely to have any influence on the physical and mental welfare of the child. Nurses were asked to visit the homes and obtain information regarding the general hygienic condition, histories of abnormalities of health, including menstruation and any other points worthy of note. Information was also obtained regarding what amount of work was done out of school hours ; whether the home lessons were done in privacy or in the general living-room ; whether they were regarded as excessive ; and, if the child lived in the country, what was the distance from school, mode of travel, and the time absent from school.

Obviously a single medical examination would give no useful information, so that three examinations were made: one at the beginning, one at the middle, and one at the end of the winter session. A thorough examination was made in every case, each child being stripped to the waist and the heart and lungs systematically examined, as well as the nose, throat, teeth, and the special senses.

The Unit of Fitness

The degree of physical fitness was obtained from the tables supplied by the late Professor Dreyer in his book *Assessment of Physical Fitness*. These tables are founded on the recognition that there is a definite relationship between the weight of the human body and the length of the trunk (height sitting), the circumference of the chest, and the vital capacity of the lungs.

The unit of fitness was obtained from the results of three distinct observations—namely:

1. By comparing the *observed* weight with the average weight *calculated* from the trunk and chest measurements.

2. By comparing the *observed* vital capacity with the average vital capacity *calculated* from the weight.

3. By comparing the *observed* vital capacity with the average vital capacity *calculated* from the trunk and chest measurements.

The difference between the observed results as obtained from the examinations and the calculated results from the tables were added together and divided by three.

This method of arriving at the unit of fitness is possibly open to criticism, but the strict accuracy of the unit of fitness is, in this investigation, of secondary importance. The essential point is to discover whether the physical fitness has undergone any change, and to what degree,

during the period under observation, and from this point of view the method adopted seems satisfactory.

The children examined were divided into four groups, as follows:

1. *Girls* given home lessons requiring 10 hours per week.
2. ,, ,, ,, ,, 7½ ,, ,,
3. *Boys* ,, ,, ,, 10 ,, ,,
4. ,, ,, ,, ,, 7½ ,, ,,

Before considering the tables dealing with the physical fitness of the groups under review, it is interesting to study the average measurements obtained from the examinations.

Height of Trunk.—In comparing boys and girls of approximately 13½ years of age, the girls were found to be taller by two inches. At 14½ years the girls were taller by one inch. These observations demonstrate that at some period earlier than 13½ years the girls had been growing at a much greater rate than the boys, but that during this period—13½ to 14½ years—the growth rate of boys had quickened, and was rapidly overtaking the girls.

Weight.—It was found that at 13½ years the girls were only 4 lb. heavier than the boys, but at 14½ years the difference in favour of the girls was 14½ lb. Over 15 years of age the rate of increase was in favour of the boys. This observation shows that girls developed much more rapidly than boys between 13 and 15 years of age, at which age the advantage was passing to the boys.

Chest Measurements.—Anatomically the chest of the female differs in some important details from that of the male. In the female there is a lessened general capacity and a greater mobility in the upper part. It is, then, of interest to note that at 14½ years of age the chest measurements are equal, but that the increase between 13½ and 14½ years of age is almost twice as great in girls as compared with boys. The boys showed an increase of 0.6 inch and the girls 1.1 inches during this period.

In comparing the heights and weights of children at 6, 9, and 13 years of age it was found that at 6 years of age the boys had a slight advantage, at 9 years of age there was almost equality, but at 13 years of age the girls were taller by 1 inch and heavier by 11 lb.

A Critical Period for Girls

The conclusion to be drawn from these various facts is that from 11 years of age, approximately, the superiority of girls rapidly increased up to 14 years of age, about which time the advantage is beginning to pass to the boys. The superiority of the girls in height reaches the highest point at about 13½ years, and in weight at about 14½ years. It is evident that between 13 and 14 years girls develop at a very rapid rate, and are almost adult when the boys are still adolescent; it is during this period that menstruation generally commences.

The period 12–14 years of age, especially the year 13–14, must therefore be regarded as a somewhat critical one for girls, as the rapid physical development coincides with a serious educational effort, to which is added the disturbing effect of menstruation.

It was also found that the increase of height and weight during the six months was much greater in some children than in others, and that during one three months the increase was greater than during the other three months. This observation demonstrates the recognized fact that the growth of children does not proceed in a steady, even flow, but rather with alternate periods of rapid and slow growth. Weight cannot, therefore, be regarded as a reliable index in determining progress in a case of illness such as tuberculosis.

It is now recognized that there is a close relationship between the sexual organs and the ductless glands. All those who have had the opportunity of examining large numbers of girls of about 13 years of age must have noticed the frequency with which enlargement of the thyroid gland was present. This enlargement, although not as a rule very marked, is nevertheless quite obvious, and, as this is the period when menstruation and other signs of rapid sexual development are becoming prominent, it seems reasonable to connect the two conditions as cause and effect.

Increased activity of the thyroid gland influences the nervous system, increasing the excitability and heightening the emotional state. Thyroid enlargement was less frequent among the older girls. This temporary thyroidism may, and probably does, aggravate the mental difficulties of the child, and renders school work more trying.

A consideration of all the factors stated points to the conclusion that it is advisable to avoid putting an undue strain on the physical and mental powers of girls during this period of rapid development. If this theoretical conclusion is sound it should be confirmed by the results obtained from the determination of the physical fitness.

Physical Fitness

The physical fitness of each child was determined at each of the examinations on the lines already indicated. Elaborate tables were drawn up showing the results obtained from the examination of each child at the three separate examinations. The following is a tabular synopsis of the results obtained.

Sex	Average Age (years)	Home Lessons (hours per week)	Unit of Fitness			Average % (inc. or dec.)
			1st Ex.	2nd Ex.	3rd Ex.	
(1) Girls	14 7/12	10	−6.5	−7.4	− 9.0	−2.5
(2) ,,	13 7/12	7½	−8.6	−9.5	−10.9	−2.3
(3) Boys	14 3/12	10	−1.2	−2.1	− 1.2	0
(4) ,,	13 3/12	7½	−3.2	−4.0	− 3.4	−0.2

The figures with algebraic signs show the variation from the recognized normal (as obtained from Dr. Dreyer's tables). The figures in the last column indicate the difference between the first and third examinations. The extreme ranges were from 12 to 15 years of age, thus comprising the age period considered the most critical, at least for girls. The table demonstrates very clearly that there is a progressive decrease in physical fitness in the case of girls, as well as a lower initial starting-point, as compared with boys. The boys showed a higher initial standard of fitness, which, with the exception of a small mid-term decrease was practically maintained throughout.

To demonstrate further the difference in physical fitness between boys and girls a table was drawn up giving the percentage of children showing a decrease of over 5 per cent., 10 per cent., 15 per cent., and 20 per cent. It was found that 34 per cent. of girls showed a decrease of over 5 per cent.; 13 per cent. showed a decrease of over 10 per cent.; 4 per cent. showed a decrease of over 15 per cent.; and 2 per cent. showed a decrease of over 20 per cent. In the case of boys, 4.5 per cent. showed a decrease of over 5 per cent.; the remainder showed a decrease of less than 5 per cent. This clearly demonstrates that the initial decrease and the progressive decrease during the school winter session is considerably greater among girls.

Home Lessons.—The home lessons given are supposed to occupy a child of average ability a definite number of hours per week. It was found that 59.4 per cent. of girls, but none of the boys, required *more* than the allotted number of hours; 25.6 per cent. of girls and 28.6 per cent. of boys required the allotted period only; 15 per cent. of girls and 71.4 per cent. of boys required *less* than the allotted period. Privacy was enjoyed by

51 per cent. of girls, but only 26 per cent. of boys were so favoured.

Medical Examination.—Excluding the lungs, no abnormality worthy of note was found. Experience derived from the examination of many thousands of children has convinced me that the condition of the lungs provides a very useful guide to the degree of physical fitness. The "normal" varies within fairly wide limits, and a close association was found between a decrease in physical fitness and a move to the extreme limits of the normal and beyond.

Menstruation.—Careful note was made of the date of the commencement as well as the character and periodicity of the monthly periods, but no history of any abnormality worthy of record was obtained.

Conclusions

1. Between the years 12 and 15 the physical development of girls is much more rapid than that of boys.
2. Sexual development in girls, with all its attendant disturbances, is very active during this period.
3. This rapid physical and sexual development of girls coincides with a strenuous educational effort.
4. The investigation shows that the standard of fitness of girls was less than that of boys, and depreciated more during the session under review.
5. Home lessons required a greater expenditure of energy by girls.
6. This is a period when the health of girls requires to be carefully guarded.

A NOTE ON THE TREATMENT OF BOILS AND CARBUNCLES

BY

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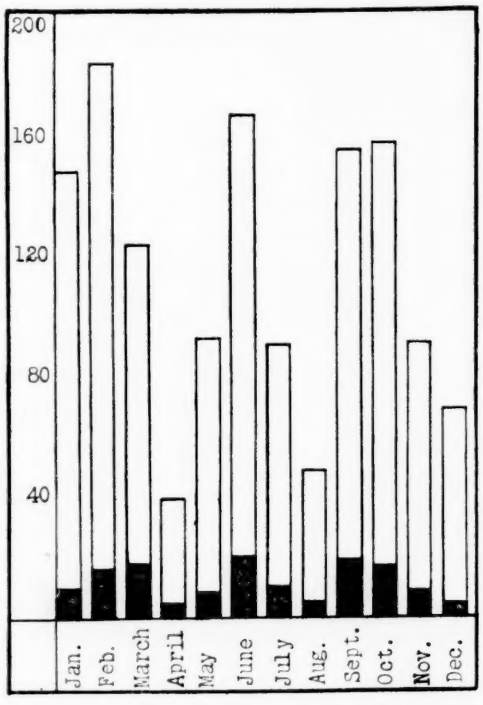
It is the endeavour of this paper to set out the result of a small recent series of boils and carbuncles treated on board H.M.S. *Hood* by the occlusive method. The dressing used was zinc oxide elastic adhesive bandage (elastoplast) applied directly to the shaven skin and extending well beyond the outer limit of the inflamed area. The surrounding skin was sterilized with 1 in 1,000 acriflavine solution, but no preliminary surgery was attempted.

In a large body of men living under industrial or service conditions the loss of "man hours" involved by intensive treatment of septic conditions is considerable. On board this ship in 1934 of a total of 1,496 fresh cases seen, 156 were due solely to boils and carbuncles. The relation of the latter to all fresh attendances from month to month in 1934 is shown diagrammatically in the accompanying chart.



The Moscow school of medicine regards pyodermic lesions as being the third most incapacitating condition after trauma and "la grippe."

Formerly it was the custom to treat these septic conditions by repeated foments, antiseptic applications, and even deliberate surgery. This entailed frequent absence from duty, often confinement to hospital, and the continual attention of a medical assistant, while the resulting disfigurement from bulky dressings and operation scars was often considerable. Newman[1], in 1933, found that when the occlusive method was exhibited to impetiginous lesions in school children the course of the condition was cut short by more than half. Incidentally, the occlusive method is now routine for empetigo in London County Council schools. The cost of medicaments under the old method of treatment was considerable, while the eventual cure seems to have been largely despite rather than due to this therapeutic exuberance.

At the historic meeting of the British Medical Association in Dublin in 1867 Lister propounded the view that damaged tissue should be protected from infection, trauma, and chemical irritation. Yet it was only during the great war that these principles were applied to septic bone surgery by Winnett Orr.[2] The same principles hold good in minor septic conditions.

A superficial infection in the tissues is followed by localization of the infection and, as pointed out by Celsus, immobility. This is Nature's defence. Necrosis with discharge of pus does not take place till this cycle is complete. Incision at an earlier stage is useless, and may do harm by spreading infection into surrounding parts. Donald,[3] speaking from a large experience of these conditions, condemns it, and Walton[4] is similarly opposed to it. Later, when pus has formed, an incision is permissible, remembering always Macewen's maxim, "An exit can also become an entrance." The pain experienced is often due to movement of a part which has become sympathetically immobilized. Dixon[5] and Robb[6] have shown what a great part is played by immobilization in septic conditions, and the latter has shown how even deep-seated sepsis may run a painless course when this has been brought about.

From these remarks it will be seen how widely former treatment departed from the principles laid down by Lister at Dublin, and by Hilton in his almost forgotten masterpiece, *Rest and Pain.*

The multitude of medicated dressings in use shows that no one is specific. Oily dressings have been recently advocated, among them flavine emulsion and cod-liver oil,[7] but their chief merit seems to lie in their harmlessness. Renewal of dressings is painless on account of their non-adhesive nature. Hygroscopic applications have had their day, among them cane sugar syrup and magnesium sulphate paste; but the disadvantages of the former are obvious, while the latter may cause damage to a devitalized skin.[8] The use of the discharge itself as a dressing may sound heretical, yet in actual practice it proves most satisfactory. The success of the method as applied to varicose ulcers has long been recognized. Under an occlusive dressing the lesion lies bathed in pus

and separated from the plaster. In this medium granulations rapidly form, and Carty[9] has observed their rapid growth in three large deep ulcers where previous forms of treatment had been unavailing. There is as yet no consensus of opinion as to the agent responsible for this acceleration of healing under the occlusive dressing.

Results of Occlusive Treatment

The method as applied to this small series has been remarkably satisfactory. Cases have been treated and released for duty immediately, while almost instantaneous relief of pain has been afforded.

A summary of the results can be seen from the accompanying table:

Number of Cases	Average Number of Dressings	Average Number of Days under Treatment
20	2–3	11–12

Only one case received hospital treatment, and that on account of the unique patchwork appearance presented by the multitude of occlusive dressings on his neck. He was treated by the usual method, the dressings remaining untouched as before. One case received adjuvant treatment in the form of collosol manganese.

Many other septic conditions—for example, whitlows, lymphangitis, ulcers, burns, etc.—have been successfully treated by the method described, but they have not been included in the cases reviewed.

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PRIMARY AXILLARY VEIN THROMBOSIS

BY

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Thrombosis of the axillary vein, without history of injury or infection, appears to be a rare condition; but only one example can be found in the literature of the occurrence of thrombosis in both axillary veins, and it is for this reason that the following case is described.

Case Report

The patient, a healthy man aged 24 years, is employed as a labourer in an electric lamp factory. He is ambidextrous, but prefers to use his left hand whenever possible. At the time of the first attack he was engaged in delivering the components of batteries from a machine by the use of his left hand and then passing them on to a shelf at his left side. This process necessitated repeated abduction of the arm. About a month before the acute attack he noticed that when lifting a heavy object his left arm felt tense and became swollen and blue. Moreover, if he continued to hold the weight above the level of his shoulder the condition rapidly became worse, but was relieved on adduction of the arm. Suddenly, in October, 1933, during a game of billiards, he discovered that his arm was becoming stiff, swollen, and discoloured; at the same time he experienced giddiness, and fainted immediately on arrival, after two minutes' walk, at his home.

On examination, soon after onset, the whole of the left upper extremity was found to be swollen, cyanosed, and cold, the physical signs corresponding with the second attack as described below. He was treated in hospital by complete rest and immobilization, and made an uninterrupted recovery within three weeks.

The next attack occurred on May 7th, 1935, and involved the right arm, but no history of prodromal symptoms could be obtained on this occasion. In the meantime he had changed his work, which now consisted of shaking lamps after they had been washed and then placing them on a shelf by his side, the process involving the use of both arms. On this occasion he was walking along a road, two days after beginning a holiday from work, when his right arm became suddenly swollen, cold, and blue, and felt first "tight," then "numb." He complained of giddiness as before, and attended an ambulance station, from which he was brought immediately to hospital.

On examination the right upper extremity was swollen and oedematous, the patient supporting it with his left arm. Passive and active movements were limited and very painful. The axillary vein could be palpated as a series of soft and tender swellings. All swelling and oedema of the limb ceased abruptly by a sharp line of demarcation at the level of the clavicle. The pulse was present at the wrist and equal in rate to that of the left side, while the blood pressure was 120/90 and equal on both sides.

He was admitted to a surgical ward, the limb immobilized on a splint, and a dressing of glycerin and ichthyol applied. Within three days the swelling showed considerable reduction, and the patient made a rapid and uneventful recovery. Three weeks later all oedema had disappeared, but distended veins were present in the regions of the anterior axillary fold and back of the shoulder, presumably the development of a collateral venous return.

Nothing abnormal was discovered by the usual pathological investigations, kindly undertaken by Dr. Frank Knott, the Wassermann reaction being negative and the blood calcium 9.2 per cent. The blood count was as follows: red cells, 4,750,000; white cells, 6,020; haemoglobin, 90 per cent.; colour index, 0.95. Differential count: polymorphs, 57 per cent.; lymphocytes, 30 per cent.; hyaline, 9 per cent.; eosinophils, 3 per cent.; basophils, 1 per cent.; platelets, normal. The *x*-ray appearance of the whole shoulder girdle and cervical and upper thoracic vertebrae was likewise normal.

This case falls into line with those hitherto described by Pearce Gould and Patey,[1] and by B. Horton,[2] in that the subject was a young healthy male and that the disturbance was probably occasioned by exertion. Moreover, the first attack involved the left arm in a man who preferred to use his left arm. The only left-sided example in Gould and Patey's series was a left-handed man, and occurred while playing golf.

Firth and Mackay[3] in 1932 reported a case of axillary thrombosis in a girl, occurring first in the right arm and then, after an interval of eighteen months, in the left. The time interval between the two attacks—in the one case eighteen months and in the other twenty-one months—shows remarkable similarity.

Lowenstein's[4] theory as to causation appears to be the most satisfactory. He demonstrated that in a number of cases the axillary vein is pressed upon by the costo-coracoid membrane and the subclavius muscle when the arm is abducted. And in this case, for some weeks prior to the first attack, swelling could be induced by abduction of the arm. Pearce Gould and Patey demonstrated, by dissection, a competent valve at this point.

The clinical picture of a sudden, painful, and cyanosed swelling of the whole upper extremity in a young healthy adult cannot be mistaken.

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THE USE OF ALUM-PRECIPITATED TOXOID IN DIPHTHERIA IMMUNIZATION

BY

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Hitherto it has not been practicable to make use of routine diphtheria immunization on a large scale in rural communities on account of the number of injections of immunizing agent which have been necessary. The introduction of alum-precipitated toxoid has rendered it possible to immunize with one injection only—provided that the claims made on its behalf are substantiated.

With a view to proving its worth, a fairly large-scale experiment was made in the Haslemere Urban District and in the Ash and Normandy Parish of the Guildford Rural District. Both of these districts are essentially rural in character—Haslemere with a population of 9,290 and an area of 5,945 acres, Ash and Normandy with 7,292 people and 6,324 acres. The school population in each, with which alone I am here concerned, is about 900 to 1,000.

My reasons for selecting these districts need be but briefly stated. Haslemere is especially likely to suffer invasion by infectious disease on account of the large number of summer visitors, whilst it is also one district complete in itself and not too extensive for adequate treatment. Ash and Normandy is a locality that has, in the past, given considerable anxiety on account of the number of cases of diphtheria and diphtheria carriers, whilst the sanitary conditions of the area lend themselves in unusual degree to the spread of diphtheria. For many reasons it is preferable for the medical officer of health to carry out the treatment personally rather than to relegate it to general practitioners.

Technique Used

Briefly, the method adopted was as follows. The parents of all children attending schools in the areas selected were invited to allow their children to be immunized and subsequently Schick-tested. Some 70 per cent. accepted, although a great many later refused to submit to the Schick test. In all, some 1,160 children were treated, mainly between the ages of 5 and 14, and 837 were Schick-tested 59 to 105 days later. Refusal to submit to more than one hypodermic injection is general, and constitutes one of the most cogent reasons for using a one-injection method of inducing immunity.

The material used was supplied by Messrs. Parke, Davis and Co., and by Messrs. Evans Sons Lescher and Webb Ltd., the dose of the former being 1/2 c.cm. and of the latter 1 c.cm. In all cases individual phials were used, although this added considerably to the cost of treatment. The most discussed aspect of the use of alum-precipitated toxoid is that of reactions produced by the initial injection. It may be stated at once that I am entirely satisfied with the small proportion of reactions and with the relatively trivial nature of such as did occur.

The site selected was just above the olecranon on the left arm, and all injections were made subcutaneously. After four or five days a very small subcutaneous lump developed at the site of injection on a large number of children, and persisted for some weeks. Many showed

Diphtheria Immunization and Schick Testing, Guildford Rural and Haslemere Urban Districts. Summary of Results

Ages in Years	Diphtheria Immunization								Schick Testing														Totals	
	Parke, Davis		Evans		Not Recorded		Totals		Parke, Davis				Evans				Not Recorded				Totals			Percentage of Success	Children Immunized	Children Schick-tested
	No.	Reactions	No.	Reactions	No.	Reactions	No.	Reactions	No.	Results			No.	Results			No.	Results			Neg.	Pos.	Pseudo			
										Neg.	Pos.	Pseudo		Neg.	Pos.	Pseudo		Neg.	Pos.	Pseudo						
1	1	—	—	—	—	—	1	—	1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	100.00	1	1
2	1	—	2	—	—	—	3	—	1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	100.00	3	1
3	2	—	—	—	1	—	3	—	2	2	—	—	—	—	—	—	—	—	—	—	2	—	—	100.00	3	2
4	10	—	7	—	2	—	19	—	5	5	—	—	6	5	1	—	—	—	—	—	10	1	—	90.99	19	11
5	62	—	41	—	12	—	115	—	31	30	—	1	28	26	1	1	6	6	—	—	62	1	2	98.46	115	65
6	57	—	42	—	14	—	113	—	36	33	2	1	26	22	3	1	9	8	—	1	63	5	3	92.95	113	71
7	62	—	67	—	12	—	141	—	38	33	4	1	51	47	4	—	7	7	—	—	87	8	1	91.66	141	96
8	51	—	62	—	2	—	115	—	39	38	1	—	49	42	4	3	1	1	—	—	81	5	3	94.38	115	83
9	57	—	75	—	5	—	137	—	36	36	—	—	61	51	8	2	4	4	—	—	91	8	2	92.08	137	101
10	50	—	76	1	4	—	130	1	35	32	2	1	54	43	9	2	3	2	1	—	77	12	3	86.95	130	92
11	53	1	72	1	2	—	127	2	37	34	2	1	51	43	4	4	1	1	—	—	78	6	5	93.26	127	89
12	51	—	63	1	5	—	116	1	38	34	2	2	52	39	11	2	4	4	—	—	77	13	4	86.17	116	94
13	41	2	70	1	3	—	114	3	33	29	4	—	39	33	6	—	3	3	—	—	65	10	—	86.66	114	75
14	8	1	13	—	2	—	23	1	1	1	—	—	3	1	—	2	1	1	—	—	3	—	2	100.00	23	5
Not known	—	—	3	—	—	—	3	—	—	—	—	—	1	1	—	—	1	—	1	—	1	1	—	50.00	3	2
Totals	506	4	590	4	64	—	1,160	8	333	309	17	7	421	353	51	17	40	37	2	1	699	70	25	Average 91.18	1,160	794

Of the 1,160 children immunized, the parents of 161 of these refused to agree to their children being Schick-tested.

In addition, a number of children were immunized but left the school or district before the Schick testing was carried out.

An additional twenty-nine children were Schick-tested, but owing to their absence from school on the date of the inspection of Schick results it is not possible to record this group as "negative," "positive," or "pseudo."

Of the seventy children who were positive after Schick testing, fourteen were re-tested, resulting in seven being negative and seven remaining positive.

From the above notes it will be seen, therefore, that the actual Schick tests carried out number 837—that is, 794 + 29 + 14.

The results do not, to me, seem fair to Messrs. Evans Sons Lescher and Webb Ltd., because they include the school which showed such abnormally poor results—twenty positives out of 136 tested.

slight tenderness, but of so trivial a nature that the children had not themselves noticed it until questioned and specially examined for it. These cases have not been included under the heading of reactions because there was nothing to give cause for complaint by children or parents, nor was there any interference whatever with work or play.

The table shows the number of cases giving reactions of a more severe degree, where complaints of swelling or pain were volunteered. One of these appeared to be a small haematoma due to the puncture of a small vein, and ought strictly to be discounted. In most there was a tender and somewhat painful lump varying from the size of a pea to that of a half walnut, and accompanied, frequently, by slight reddening of the skin and, in rare cases, by slight oedema. *In no case was there any constitutional disturbance.* In fact the symptoms were no worse than those occasioned by an accidental knock on the elbow. The symptoms developed on the third day, reaching their maximum on the fifth day, and thereafter subsided gradually over a period of a week. Reactions were more numerous in older children, none at all occurring below the age of 10. I was particularly struck by the prevalence of reactions amongst overgrown and over-developed children, such as appear much older than their actual years. This is interesting in view of my experiences with adults recorded later. The most severe reactions were in children of 12 to 14 years.

Although immunity is presumed to develop within forty-two days, Schick testing was delayed for a minimum period of nine weeks after treatment in order to give every opportunity for a fair test. Of the number of children treated, 72 per cent. were later Schick-tested. The remaining 28 per cent. were either absent from or had left school, or refused to submit to a further injection. Readings were taken on the fourth or fifth day after testing, and in many cases on several consecutive days between the third and seventh.

Results

The results are tabulated to show the measure of success at different ages and with each firm's product. As many as 91 per cent. of the children appear to have been successfully immunized.

The immunizing agent used and marked "Not Recorded" was almost certainly entirely that of Parke, Davis and Co., since approximately equal numbers of children were done with each firm's product. The most striking lesson from the results tabulated above is undoubtedly the complete absence of reactions in children below the age of 10 years, accompanied by a relatively high percentage of successful results. Of the 437 children immunized not one showed any reaction, and 93.6 per cent. were Schick-negative. Of the seventy positive reactions only three were of the usual strongly marked type. Most of the others were exceedingly faint, and in artificial light would certainly have been missed. Every doubtful case was labelled positive.

In one particular school the number of Schick-positives was so large (twenty out of a total of 136 treated) that it was felt that sufficient time had possibly not been allowed to permit of the development of immunity. Accordingly, fourteen of these were re-tested at the end of a further period of five weeks. In seven—that is, 50 per cent.—of these, the positive reaction had become negative. (These results are not included in the table.) Apparently, in some cases only a partial immunity is produced, and either a larger dose of toxoid should be used, or else a stronger concentration of toxin used for the Schick test, in order that these partial failures may be more definitely revealed. It is possible that some cases show a very delayed response to the immunizing agent.

It may be of some significance that this particular school is one which has, during the past year, given a remarkably large number of cases of diphtheria and of carriers, mostly of a type peculiarly resistant to treatment. In any case, it seems that a larger interval between immunization and Schick testing would make the percentage success of this treatment appreciably higher.

Treatment of Adults

A brief note on the results obtained in treating a small number of adults is of interest.

The total number immunized is only seventeen. Of these, two showed reactions of a severe though not alarming character. In each case symptoms developed on the third day, reached a maximum on the fifth, and thereafter subsided during the following week or so. Both of the individuals were undoubtedly of an especially unsuitable type for experimental treatment of any kind, one in particular being highly introspective, subject to asthma, nettle rashes, and chronic mild invalidism. Both of these persons had some constitutional reaction, of the nature of a cold in the head, with temperature mounting to 100° or 101° F., accompanied by a painful lump at the site of inoculation, oedema, and reddening of the skin of the arm. All adults treated were found to be Schick-negative on subsequent testing. As a result of these cases all adults were subsequently treated by two doses of T.A.F.

An experiment was made by administering two small doses of alum-precipitated toxoid, at intervals of one week, 1/10 c.cm. only being used on each occasion. The number of reactions, and the severity of them, was so noticeably more than by the single-dose method that this was given up after treating just over 100 cases.

Planning of an Immunization Scheme

It is realized that the immunization of a school population such as I have just described is, by itself, of no permanent value. A scheme for continued annual treatment of all in-coming children must be put into operation in order to preserve an immune population. In settling the details of such a scheme, regard must be paid to practical possibilities rather than to the ideals one would like to aim at.

The handing over of all immunizations to private practitioners is open to many objections. In addition to the extra expense involved, it is undoubtedly better that the whole scheme should be operated by one individual rather than by an untold number of practitioners, many of whom may have had no experience of Schick testing, and whose results in any case may vary individually. It becomes absolutely essential to reduce the number of visits necessary per patient to the minimum. For that reason preliminary Schick testing must be dispensed with entirely. Alum-precipitated toxoid has the great advantage of eliminating all but one injection, and will in future be used except for adults and for those children over 12 years of age whose maturity leads to the expectation of reactions similar to those in adults.

It is desirable that children should be protected against diphtheria before they attain school age. There is the added advantage that, from the results I have obtained, reactions are few or absent, and that the percentage of success is apparently at its optimum. In future, it is hoped to introduce a scheme for the immunization of children attending infant welfare centres, and all commencing school at the age of 5.

Conclusion

I am aware that it is generally held that Schick testing subsequent to immunization should be invariably performed. Admittedly it is a policy of perfection, but in widespread rural districts the subsequent two visits involved, and the time occupied by them, render it extremely difficult, or possible only at the expense of a reduction in the scope of the treatment. It seems to

me much wiser to perform immunization in all schools, and to recognize and accept the fact that some 5 to 8 per cent. of children may remain susceptible. It is surely preferable to have only this small percentage of susceptibles throughout the whole district rather than patches of complete immunity and patches of complete untreated susceptibility. From time to time selected schools will be Schick-tested in order to exercise some check on the results obtained, but whereas it is hoped to immunize some thousand children annually, only one-fifth of these may be subsequently tested.

I question also absolute reliance upon the result of the Schick test. There is no proof that any one negative result represents a *permanent* immunity. It may be affected by other factors at present unknown, just as the Wassermann reaction may be affected by drugs or illness. Indeed, I have a record of one boy admitted to hospital with a severe attack of diphtheria who had been found Schick-negative barely four weeks previously, and who had on that account, presumably, not been immunized.

The total cost of the treatment has been rather less than 2s. 6d. per head. If bulk bottles of alum-precipitated toxoid had been used this would have been reduced to very little more than one shilling.

Every child has been supplied with a certificate stating the treatment given and the result of the Schick test. This should prove of importance in later life and in the event of removal to other districts.

Alum-precipitated toxoid has been used in three or four closed institutional populations in this district. The results in every instance have been exactly analogous to those recorded above. In every case treatment has been completely successful in stamping out endemic diphtheria, and no person who has received one injection of alum-precipitated toxoid has developed diphtheria.

PREVENTION OF DIPHTHERIA BY THE "ONE-SHOT" METHOD

USING ALUM-PRECIPITATED TOXOID

BY

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AND

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Recent studies have materially increased our knowledge of the various factors which enter into the creation and development of immunity. As the interest which medical officers of health take in the subject of diphtheria is largely that which concerns the preventive aspect, so this paper deals with the chemico-immunogenic substance alum-precipitated toxoid (A.P.T.), in respect to its effects on a number of children on whom it was tried out.

The material for the investigation consisted of 370 children in three residential institutions. The table given below shows the percentage of positive reactors. An interesting feature is the high number of positive reactors in Institution C. A rational explanation of this lies in the fact that there was no diphtheria in this sheltered community for several years.

Institution	No. of Children Schick-tested	No. of Schick-positive Children	Percentage of Positive Reactors	Average Age of Children
A	182	55	30	12½ years
B	112	35	31	11½ years
C	76	40	53	10½ years

All the Schick-positive children were given 1 c.cm. of A.P.T. by deep subcutaneous injection. (The Moloney test was not applied, as this work is the preliminary of a large-scale immunizing campaign in which it is the intention not to do the Moloney test if it is safe to do without it.) The following table clearly demonstrates the high immunogenic properties of this substance, as determined by its ability to convert positive reactors to negative two months after its administration.

Institution	No. of Schick-positive Children given A.P.T.	No. of Children Schick-negative 2 Months after A.P.T. Injection	Percentage Conversion (approx.)
A	55	53	95
B	35	31	90
C	40	37	93

Reactions Encountered and Results

These fell into four groups. (1) The commonest reaction (almost universal) was that of a small painless induration at site of injection, approximately the size of a pea. (2) Diffuse erythema extending, approximately, around an area of three inches from site of injection was present in 10 per cent. of those injected. (3) Brawny induration, with hyperæmia over practically the whole arm, with stiffness in joints and local heat, was present in six cases and took six days to go back. (4) In one case there was a minute sterile abscess at the puncture site. In view of the fact that 84 per cent. of all the children injected were over 10 years of age, the reactions were surprisingly light, and the few that were marked were in the older children.

As to the reliability of the preparation 90 to 95 per cent. of the children have been rendered Schick-negative. This shows definitely its high conversion power. There has been no reaction of sufficient severity to warrant apprehension. Indeed, the reactions have been of such a comparatively mild nature that the doctors engaged on this work with us have expressed a desire to carry out large-scale campaigns in other districts, using the same material. In addition, the procedure is less time-consuming, and the failure-to-turn-up-for-second-injection bugbear does not exist.

If reactions could be rendered less severe without impairing efficiency we believe that we would then be in the possession of an ideal agent for immunization.

Conclusion

Our conclusion is that (*a*) A.P.T. is, as indicated by the variant, the Schick test, an immunizing agent against diphtheria of very high degree; and (*b*) in our experience it is quite safe to use in children under or over 10 years of age, subject, of course, to the limitation that it may cause a brisk reaction. The object of this presentation has been achieved if the attention of workers in this field is obtained, so as to elicit their experiences as regards (1) the necessity of a Moloney test, (2) any very severe reactions met with, and (3) the percentage of "converts" obtained with A.P.T.

The materials used in this work were supplied by Burroughs Wellcome and Co.

We have received the first issue, published at Rosario last June, of a new Argentine quarterly, entitled *Anales de Cirurgia*. The issue contains exclusively original articles, among which may be mentioned those on treatment of gastric and duodenal ulcer, neurofibromas and schwannomas, lympho-epithelial cysts of the neck, intravenous cholecystography and affections of the gall-bladder (Victor Putti), and renal carbuncle.

Clinical Memoranda

Primary Abdominal Torsion of the Omentum with an Attempt at Spontaneous Cure

Primary abdominal torsion of the omentum is a rare condition, as is indicated by the fact that the paper by Corner and Pinches (1905) contained all the cases of omental torsion in the literature, and numbered fifty-three. The paper by Lejars (1907) added a few more and brought the total up to sixty-six, but of these sixty-six cases only seven were of the primary abdominal type—that is to say, they were not associated with a hernia and had developed without apparent cause. In 1925 Ernest Cowell, in a comprehensive survey of the whole subject, recorded a total of nineteen cases—his own included—all of them being primarily abdominal. The case described below was remarkable in that there was an attempt at spontaneous or natural cure, for I have been unable to find in the literature one other with similar characteristics.

An unmarried man, aged 24, was admitted to the Holme Valley Memorial Hospital on September 4th, 1934, complaining of abdominal pain of four days' duration. The pain, which was colicky in nature, commenced after the midday meal on September 1st, but abated in about two hours. It

recurred on September 2nd at midday, and persisted until the operation two days later. At no time was there any vomiting. The bowels were opened after a dose of castor oil administered by his mother on September 2nd. On examination the tongue was clean and moist, and the breath was not offensive. The abdomen was flat and moved well on respiration; there was tenderness over McBurney's point, and some rigidity in the same area. No mass or free fluid could be detected by palpation.

Under spinal anaesthesia (percaine, scopolamine, and morphine) a gridiron incision was made over the tender area. On exploring the abdominal cavity with the index finger a firm mass was detected fixed to the anterior abdominal wall, and on being detached was felt to slip upwards. The appendix was examined and found to be normal. There was no blood-stained fluid in the peritoneal cavity. Search was then made for the mass; it was retrieved without difficulty, and after a little manipulation was coaxed into the wound. It consisted of omentum, approximately 4 × 3 × 2 in., and was firm and brawny to the touch. Careful inspection showed that it was roughly bisected by an indefinite dark line into right and left portions of about equal area. With the handle of a scalpel passed along the dark line, two flaps of omentum were opened outwards like the doors of a cupboard, disclosing a mass, smooth, glistening, jet black in colour, and about three inches in length, closely resembling a gall-bladder in shape and appearance. Traced upwards the mass revealed a pedicle twisted three times in an anti-clockwise direction, and attached to the greater curvature of the stomach in the neighbourhood of the pylorus. The pedicle was crushed, ligated, and buried, the mass removed, and the abdomen closed.

Comments

It would appear from a perusal of the literature that adhesions following torsion of the omentum are slight and delicate, and no mention is made of a twisted portion of omentum completely surrounded by the main mass in a manner likely to terminate in a natural cure. The absence of blood-stained fluid was an unusual feature of this case.

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A Method of Revealing Transradiant Foreign Bodies Impacted in the Oesophagus

The radiological demonstration of transradiant foreign bodies in the oesophagus is often a matter of extreme difficulty. I give below a method which I have found of value, and which does not seem to be as well known as it merits. Briefly, it consists in giving the patient several small pieces of cotton-wool to swallow, about half an inch in diameter, well soaked in a thick emulsion of barium sulphate. A teaspoonful of these pieces should be swallowed in one bolus, and this should be repeated if necessary. A fragment of the wool may catch on the transradiant foreign body and be arrested here. A film is then taken. The patient is then given a glass of water to drink, and the wool is observed fluoroscopically. If this remains fixed whilst the water passes down it is strong evidence that it is attached to the foreign body.

Case 1.—A man, aged 67, was admitted to hospital. He stated that one hour previously, when eating stewed rabbit, he felt a piece of bone stick in his gullet at the level of the first rib. Fluoroscopy and a skiagram failed to reveal any foreign body. An emulsion of barium passed down the oesophagus apparently normally. The patient was then given fragments of cotton-wool, soaked in barium emulsion, as described above. The first bolus passed down without difficulty, but a second bolus was arrested at the level of the first dorsal vertebra. This remained fixed, though a glass of water was subsequently swallowed. The patient was then referred to the laryngologist as a case of impacted foreign body, probably bone, in the oesophagus. Oesophagoscopy half an hour later revealed the fragment of cotton-wool at the site reported. When this was removed a portion of the rib of a rabbit was seen impacted transversely across the oesophagus. This was also removed without difficulty. The patient was discharged the next day.

Case 2.—A woman, aged 62, stated that two hours previously, when eating fish, she swallowed a bone. She felt this stick in her gullet just below the level of her larynx. No foreign body was visible on fluoroscopy. Barium emulsion passed down apparently normally. The patient was then given fragments of cotton-wool, as described. The first bolus was arrested at the level of the sixth cervical vertebra. A glass of water was then swallowed, but did not move the cotton-wool. Oesophagoscopy revealed the cotton-wool at this site. The wool was removed and disclosed a fish bone, 1½ inches long, impacted transversely across the oesophagus. This was removed. No further discomfort was felt by the patient, who was discharged from hospital the next day.

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Reviews

DIET THERAPY IN PULMONARY TUBERCULOSIS

Dr. MAX GERSON sets himself two tasks in his recently published book[1]: to demonstrate the effectiveness of his now well-known "salt-free" diet even in advanced cases of pulmonary tuberculosis, and to convince the chest specialist that once the broad outlines of the theoretical basis and application of the diet are grasped the details necessary in practice can be worked out without difficulty. The therapeutics of pulmonary tuberculosis, especially in advanced cases, have hardly reached the stage at which the careful study of any new method of treatment advocated can be neglected. Unfortunately, Dr. Gerson has not rendered this easy, for assimilation of his volume of 600 large pages of text, much of it in small print and with several hundred cross-references, will prove a formidable undertaking for the most stout-hearted reader.

The first 250 pages expose the theoretical basis of the treatment, and the author emphasizes that the theory is an attempt to explain the results obtained by the method practised somewhat empirically at first. Believing the symptoms of tuberculosis to be essentially allergic in character, Dr. Gerson considers the unfavourable course the disease assumes in some individuals to be due to a constitutional factor—an unspecific allergic predisposition, especially against sodium chloride and certain proteins and carbohydrates—which causes the healing of the lesions to be protracted or even impossible so long as the latter are present in the tissues. Physiological and biochemical data are given in support of the hypothesis. The second part of the book describes in detail the diet and its modifications as carried out in practice. Not only must the entrance of certain substances be prevented, but the diet must be so constituted as to cause the breaking down of any stores in the body. The slight increased cost of such a diet is due solely to the careful weighing and supervision required.

The evidence submitted by Dr. Gerson in the remainder of the book, comprising the full case records (illustrated with excellently reproduced skiagrams) of fifty-one treated patients, considered in the light of our helpless attitude before an individual with bilateral pulmonary tuberculosis not benefited by rest or amenable to surgical treatment, would seem to justify careful study and extensive trial of the method in this type of case.

SANITARY SCIENCE: A NEW MODEL

In 1901 Professor Sedgwick, a pioneer exponent of public health in the United States, issued a work on the principles of sanitary science which became widely recognized as an authoritative pronouncement. The remarkable advances which have been witnessed in the applications of science to health since Professor Sedgwick wrote have prompted the publishers to invite two of his former colleagues to recast the original book in the light of present-day knowledge.

The new publication,[2] which appeared lately, is addressed primarily to the general reader and to students of science and engineering interested in public health. In it the subject of water supply is duly presented. The role of ice as a vehicle of disease and the precautions required for the protection of bathers in swimming ponds are dealt with also. The sanitation of summer camps likewise receives attention: it is a question of increasing moment here as in the United States. The article on milk includes pasteurization, of the value of which in America the authors appear convinced. There is an informative discussion of noises, which are classified according to their sources, intensities, and decibel values. In the section on housing, a subject which has its problems both in England and in America, the opinion is stated that "it is impossible to say definitely that bad housing *per se* is responsible for disease and death." Other outstanding articles are those on carbonic oxide poisoning, nutrition, and chronic disease.

A notable feature of the book is the use made of the historical method to point the moral of epidemiology. The outbreak of cholera, for example, round the Broad Street Pump in London, the typhoid fever at Caterham and Redhill and on the Merrimac River, the water-borne cholera at Hamburg, the oyster-borne typhoid at Wesleyan University (Conn.), and the recent extensive amoebic dysentery in Chicago are all recounted, and bring more vividly home to the mind than any general warning could do how, under epidemic conditions, retribution follows ignorance or neglect with exemplary precision.

We have observed no errors in the book, and, remembering that it is addressed to lay readers, no omission of importance, though we should have been glad to learn more of the authors' views on food preservation and canning than they have vouchsafed. The work is cordially recommended to medical officers in this country. Lucid, vigorous, and up to date, it worthily emulates its distinguished prototype.

STERILITY

The National Committee on Maternal Health (Incorporated) of the United States has added another to its already considerable list of publications, in the form of a volume on *Human Sterility*,[3] by Professor S. R. MEAKER of Boston. It is dedicated somewhat romantically to "the woman who embodies the true spirit of motherhood"; the true spirit of fatherhood apparently does not deserve the same recognition.

Professor Meaker is aware that the time has not yet come for an exhaustive treatise on sterility, but thinks it worth while to assemble the knowledge which is now well established. Sterility is tersely defined as "inability to initiate the reproductive process," taking, therefore, no account of inability to carry the reproductive process to a successful conclusion. Childlessness resulting from the use of contraceptive methods is rather inconsequently called "voluntary sterility." It is admitted that there are no data from which the incidence of sterility can be calculated, the proportion of childless marriages being clearly inadmissible as evidence. The author believes that "contraception of some type is now employed to limit the size of the family by the great majority of couples in this country"—that is, the U.S.A. The suggestion that contraceptive methods cause subsequent sterility is rejected except in the case of those methods which cause local damage.

The causation of sterility is dealt with in great detail, and is regarded as very complex: sixty-seven different causative conditions are enumerated as occurring in husband or wife. Seldom does sterility result from a

[1] *Diättherapie der Lungentuberkulose.* By Dr. Max Gerson. Leipzig und Wien: Franz Deuticke. 1934. (Pp. 620; 154 figures. M. 36 unbound; M. 39 bound.)

[2] *Sedgwick's Principles of Sanitary Science and Public Health.* By Samuel C. Prescott, Sc.D., and Murray P. Horwood, Ph.D. Rewritten and enlarged. New York: The Macmillan Company; London: Macmillan and Co., Ltd. 1935. (Pp. 654. 18s. net.)

[3] *Human Sterility, Causation, Diagnosis, and Treatment. A Practical Manual of Clinical Procedure.* By Samuel Raynor Meaker, M.D. London: Baillière, Tindall and Cox. (Pp. 276; 27 figures, 16 tables. 18s.)

single factor, the average number of factors present in each sterile couple being 4.81. Recent work has demonstrated the peculiar importance of the secretions, especially the prostato-vesicular secretion in the male and the cervical secretion in the female. Under various conditions these secretions may become hostile to spermatozoa, and the subject of "hostility of the secretions" looms large in this connexion. The author holds that cervical insemination—that is, discharge of semen directly into the cervical canal—is requisite for the occurrence of conception; the chances of spermatozoa deposited in the vagina ascending into the uterus are regarded as remote, although it is admitted that they are able to "swim against the current." From this thesis several practical conclusions are drawn: thus *effluvium seminis* becomes unimportant, for spermatozoa deposited in the vagina are wasted in any case; further, chemical contraceptives introduced into the vagina are useless; on the other hand, abnormal shapes and positions of the uterus which make the external os relatively inaccessible become factors of prime importance, and abnormal conditions of the cervical secretion may alone suffice to cause sterility.

Among other causative factors a prominent place is held by ovarian hypoplasia, described as "an exceedingly common condition, as every gynaecologist can attest"; it is added that "ordinary degrees [sic] of hypoplasia are better styled juvenilism." In this connexion the author speaks of "oögenic underfunction" as occurring in ovaries that are neither hypoplastic nor permanently damaged. Retention cysts in the ovary are held to be a cause of oögenic underfunction, inasmuch as they raise intrauterine tension and thus make it more difficult for new follicles to complete a normal development. The clinical fact that amenorrhoea is rarely associated with "cystic ovaries" is difficult to reconcile with this view.

The existence of depressed conditions of the general health is regarded as an important cause of sterility in both sexes, and equal importance is attached to three varieties of endocrine dysfunction—namely, anterior pituitary failure, thyroid failure, and ovarian failure—but the diagnosis of these conditions is evidently a matter of considerable difficulty. The section dealing with the "Diagnostic Study of the Sterile Mating" will excite general interest. The standpoint is taken that involuntary sterility of one year's duration indicates a definite degree of infertility and calls for thorough investigation. The thoroughness of the investigation advised may be judged by the fact that the "basic routine study" requires a full week for its performance by the urologist, the gynaecologist, the internist, the endocrinologist, and the clinical pathologist, all of whom are essential to the inquiry. It is not surprising that the author should advise the establishment of a special clinic, staffed by a group of workers who will bring to it a live interest and who will regard each investigation as an incursion into uncharted territory. It is obvious that such investigations cannot be carried out in ordinary hospital practice, and the reader carries away the discouraging impression that the scientific investigation of childlessness is a luxury reserved for the rich.

The author has some interesting things to say about hystero-salpingography, and this section is illustrated by *x*-ray plates of uncommon merit. The details given of the post-coital vaginal examination are instructive, but the description of the investigation of endocrinopathies leaves the reader a little doubtful of their practical importance. The practical aim of treatment is stated in pseudo-scientific terms thus: "To remove sufficient of the sum-total of depressing factors so that the fertility-sterility level may rise above the threshold of conception"; in simpler language—to enable the woman to have a baby. The treatment of the various depressing factors which may be encountered is passed in review, and much useful and practical information may be gleaned from these pages. With regard to artificial insemination the sensible remark is made that in order adequately to test this method it must be repeated many times: it is unreasonable to expect immediate success in view of the many chance obstacles that may be encountered by the spermatozoon in search of an ovum. The author appears to sympathize with Marion Sims, who in 1886 abandoned the practice after trying it in six cases, only one of which was successful. The results achieved by the author's methods are distinctly encouraging—eighteen pregnancies in a series of thirty-four cases treated and followed up; two of the eighteen ended in miscarriage, and there was one ectopic pregnancy. From other statistics given, the interesting point emerges that there were two ectopic cases in seventy-seven pregnancies following treatment for sterility.

Professor Meaker's work must be regarded as a pioneer effort, and as such it is deserving of both welcome and praise. Enthusiasm is a quality peculiarly necessary for such work, and he evidently has it in abundance. He has made a praiseworthy effort to bring order into a subject about which much confusion of thought exists, and while at present the order he has introduced is elaborate and complicated, there is room for hope that as experience increases simplification will follow.

CONTRACEPTIVE TECHNIQUE

It is pleasant to meet, in *The Principles of Contraception: A Handbook for General Practitioners*,[4] by Dr. JOAN MALLESON, a work on birth control that is not exactly like every other work on birth control. Writers on this subject may perhaps be criticized for adding to the existing congestion, but it is not fair to blame them for the fact that what they have to say can only with difficulty be distinguished, in form and in substance, from what others have already said again and again. The established principles and procedures are very limited in scope and their content practically dictates the form that any exposition of them must take.

Dr. Malleson's book, however, has a freshness of presentation and outlook that could hardly have been thought possible at this time of day. Although it says nothing new it yet contrives, by the emphasis that is placed throughout on the author's own observations, own preferences, own instructional technique, to give the appearance of being an original work. If Dr. Malleson has steeped herself in the literature of the subject there is no evidence of it here. The work is written straight from the heart and mind of a general practitioner, and achieves the author's avowed purpose of stating only what she herself has found of value in a considerable experience of imparting birth control instruction to patients of various social classes and grades of intelligence.

The work has one further merit that is unusual enough to deserve special mention: it does not merely profess to be written for medical practitioners, it *is* written for them and for no other class of readers. The author has thus excluded from her exposition the elementary and highly stylized descriptions of the female genito-urinary tract, and the other few oddments of first-year anatomy and physiology which most writers of birth control manuals seem to regard as essential (otherwise why introduce them?) for the instruction of their professional colleagues.

[4] *The Principles of Contraception: A Handbook for General Practitioners.* By Joan Malleson, M.B., B.S. London: Victor Gollancz, Ltd. 1935. (Pp. 160; illustrated. 4s. 6d. net.)

Notes on Books

The great encyclopaedia on ferments compiled by Professor C. OPPENHEIMER[5] is generally recognized as the leading authority on this branch of biochemistry. The author has now begun a supplement which is concerned with work done since 1925. It is hoped to complete this supplement in the next three years. The first number has just appeared, and deals with the various esterases such as the lipases, cholin-esterases, and phosphatases. Various advances in knowledge of considerable importance to medicine are recorded. For example, the study of acetylcholine esterase has done much to explain the physiological action of this substance, while the study of the phosphatases has thrown new light on bone formation and bone repair. The volume is essentially a work of reference, but a perusal of it shows that the high standard set in the original work is being maintained in the supplement.

A fourth edition of Professor J. W. BIGGER'S *Handbook of Bacteriology*[6] has appeared three and a half years after its predecessor, and concurrently with the appearance of the first Spanish edition. The chief changes have been made in the chapters dealing with water, diphtheria, and typhoid fever, but the whole of the text has been revised in order to bring the information up to date. The book is intended for medical practitioners as well as for students, and is a well-designed stepping-stone to the more technical manuals. It contains, however, all the information likely to be required by the non-specialist reader, and is therefore particularly commendable to the general practitioner who needs a simple and yet comprehensive reference book on bacteriological technique. The illustrations are good and well chosen.

Volume II of *Modern Treatment in General Practice*, under the editorship of Mr. CECIL P. G. WAKELEY, has now been published by the *Medical Press and Circular*, in whose columns this series of articles appeared week by week. Its price is 10s. 6d., and the editor suggests, not without reason, that the book might fittingly be described as "Practical Applied Medicine" for those who feel the need of keeping in touch with up-to-date methods.

[5] *Die Fermente und ihre Wirkungen. Supplement. Lieferung I.* By Professor Carl Oppenheimer. Den Haag: W. Junk. 1935. (28s.)
[6] *Handbook of Bacteriology. For Students and Practitioners of Medicine.* By Joseph W. Bigger, M.D., Sc.D., F.R.C.P.I., D.P.H. Fourth edition. London: Bailliere, Tindall and Cox. 1935. (Pp. 458; 98 figures, 5 coloured. 12s. 6d.)

Preparations and Appliances

A CHEAP APPLIANCE FOR POSTURAL DRAINAGE

Dr. H. V. MORLOCK and Dr. A. J. SCOTT PINCHIN write from the City of London Hospital for Diseases of the Chest:

The importance of postural drainage of the lung and bronchi would appear to be insufficiently recognized in general practice, and even when used is carried out in so perfunctory a manner as to be of little real service to the patient.

Though this method of treatment by no means takes the place of bronchoscopic drainage in pulmonary suppurative disease, it must be used consistently between the treatments, and in cases of bronchiectasis too advanced for lobectomy the patient may be kept in good health for years by this means. The posture must be maintained in the early stages for most of the twenty-four hours, and later, when the patient is about or at work once more, the whole night must be spent in position. It is therefore necessary that the patient should be made as comfortable as possible in the unusual posture taken up.

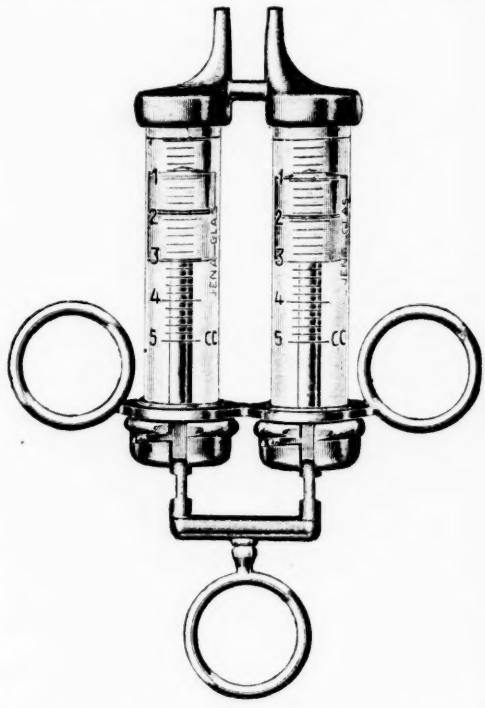
The most convenient method by which this may be attained is by the use of the Nelson postural drainage bed described in this *Journal* (August 11th, 1934, p. 254). The House Committee at Victoria Park Hospital has supplied eight of these beds for the wards. The cost, however, is high—in the neighbourhood of £14 each—and is prohibitive to most out-patients. We have therefore designed a cheap form of apparatus, which may be used in place of the more expensive bed. Several patterns have been tried, the cost increasing with elaboration. The originals were made unadjustable on a triangular frame, like a roof with a pitch of one foot or fifteen inches; this was mounted on a base frame to fit a single bed, five-ply wood being used for the flat surfaces. This was improved by means of slots in the frame and a middle adjustable support, the ply boards being hinged so that the height might be varied.

For hospital patients who have been trained in posture the adjustable form is not essential, and the simple form, with two inclined planes on a triangular support and base, is sufficient. One form can be adjusted or let down into the flat position, and this, we understand, can be made by any handy carpenter for about 30s.; the simpler form mentioned will only cost about 17s. The secretary of the hospital, Mr. George Watts, will be pleased to supply further information or a drawing to anyone requiring more detail.

TWIN-INJECTION SYRINGE

Mr. F. J. HENRY, M.B., F.R.C.S.I. (honorary visiting surgeon, Royal City of Dublin Hospital), writes:

Messrs. Fannin have constructed to my design the double-barrelled syringe shown in the accompanying figure. It consists of two ordinary 5 c.cm. Record syringes, joined together



at either end with adjacent eccentric nozzles, the pistons being connected by a transverse bar carrying a ring grip. I have found it useful in treating varicose veins by the "twin-injection" method when working single-handed, as, unless one is ambidextrous, it is rather difficult to puncture and inject a vein with two separate syringes simultaneously.

A HAEMOGLOBIN SCALE

Messrs. Coates and Cooper of 94, Clerkenwell Road, E.C.1, announce that they will supply, free of charge to medical practitioners on application, a new haemoglobin scale issued by their principals, Messrs. A. and S. Serpens of Copenhagen. Filter paper slips are provided to receive a drop of blood, and this should be compared with the scale of colours by daylight only immediately the drop has dried.

SODIUM MANDELATE

We have received from Boots Pure Drug Co. Ltd., Nottingham, a description of their new product sodium mandelate. The use of mandelic acid as a urinary disinfectant is rapidly becoming established, but if the free acid is given it is necessary to neutralize it with sodium bicarbonate. The sodium salt is therefore more convenient in practice. The dosage is about 3.5 grams four times a day. It is of course necessary to render the urine acid by administering also ammonium chloride.

TO-DAY'S USES FOR YESTERDAY'S DRUGS

WITH SPECIAL REFERENCE TO PHENOL AND SODIUM SULPHATE *

BY

J. C. LYTH, M.B., B.S.LOND.

It seemed to me that the annual meeting of the Yorkshire Branch of the British Medical Association in York afforded an opportunity to consider for a moment an aspect of modern medicine which must have struck other of my contemporaries ; I refer to the way in which some of our old friends of the *Pharmacopoeia* keep coming into their own again. I thought that York was in some sort a parallel. The Roman capital of the North ; sacked and burnt in turn by Saxons, Danes, Normans, and Scots ; always coming down on the wrong side of the political fence—for York was Lancastrian in the Wars of the Roses, Royalist in Cromwell's time, the centre of resistance to the Norman conquest, and mixed up with every rebellion which brewed up from the disastrous Pilgrimage of Grace to the " '45 "—yet has York survived. And so, from generation to generation of physicians, do some drugs survive and achieve fresh usefulness in spite of having failed to hold their supremacy in their original line. This can be seen in the brief space of one's own quarter of a century of practice.

New Uses for Old Drugs

I could give a long list of drugs, in use when I was young, which are now employed largely or entirely for quite another purpose. The following will serve as examples :

Iodine, which persists as a disinfectant and counter-irritant, but whose internal use and effect upon the endocrine and lymphoid systems was then unknown. Yet seaweed broth is stated to have been used for adiposity several hundred years ago.

Calcium was used when I was a student in the form of lime-water for babies and vaguely as a possible haemostatic and bone-forming substance. After going almost entirely out of favour it has come into use again owing to its remarkable effect on the vasomotor mechanism, as a stimulant to the adrenal glands, and as a cardiac tonic.

Arsenic, whose use in one form or another for syphilis and other blood infections was then unknown.

Tannic acid, then used chiefly as a gargle or throat paint ; now so deservedly popular as a treatment for burns.

Quinine, then a malarial specific and general tonic ; now also recognized as valuable for producing uterine contractions, as a cardiac stimulant, and for fibrinating varicose veins.

Camphor, in those days an expectorant and " alterative " ; now, when injected intramuscularly, the most important quickly acting cardiac stimulant at our disposal.

So on *ad infinitum* ; but the recital would serve no useful purpose. I will take instead two drugs only, phenol and sodium sulphate, and relate how my regard for these old friends has been deepened by the new uses to which I put them ; uses with which perhaps some may not be familiar. I have chosen these two because they are both ordinary everyday drugs, each having a specific use with which everyone is familiar, the one internal, the other external ; and in both cases these uses have rather fallen into neglect for newer and more complicated substances.

* Abridged presidential address, given at the annual meeting of the Yorkshire Branch of the British Medical Association at York, June 22nd, 1935.

Phenol

First, then, I take phenol, or carbolic acid. Introduced by Lister as a disinfectant and antiseptic, carbolic acid still remains the standard bactericide by which the properties of all others are gauged. It was also recognized as a local anaesthetic. It was not given internally to any great extent, though it was used fallaciously as an internal disinfectant, both of the alimentary canal and of the respiratory system. Such was the carbolic acid to which I was introduced twenty-five years ago. Although it has long been superseded by less toxic antiseptics I have still a very great respect for it in two directions.

Phenol for Injecting Varices

In the first place, I use it for the fibrinization of varicose veins. This use is of course generally known ; what I cannot understand is the reason for the popularity of such a medium as quinine and urethane when carbolic acts just as effectively and possesses several advantages. In the pure (liquefied) state it is profoundly antiseptic of course, not needing to be kept in sterile ampoules, and automatically sterilizing the syringe between injections ; it is locally anaesthetic ; it produces a perfectly good clot, occluding the varix quite as effectively as other agents ; it is no more liable to produce a sterile slough from leakage back into the tissues ; and, above all, as compared with quinine, it entails no risk of alarming acute cinchonism, of which I have had one experience. Incidentally, it should appeal to my fellow Yorkshiremen and our Scots associates because the cost is negligible.

Phenol as a Gastric Sedative

The other use I have found for carbolic acid is not, I imagine, so generally known. I refer to its effect as a gastric sedative of very great value. I came across this many years ago when endeavouring to check vomiting in a case of uraemia. This was the principal symptom: persistent, uncontrollable vomiting. Ordinary sedatives failed to act ; morphine, of course, was contraindicated. I looked through my edition of Hale-White's *Materia Medica*, and noticed phenol mentioned in a list of theoretical anti-emetics " in some cases." Although I could find no mention of its therapeutic use as such, in desperation I gave a two-minim dose. The effect was immediate and dramatic. The vomiting ceased.

Since then I have found it consistently effective, and indeed look upon it as still the best gastric sedative I have in my dispensary, with the possible exception of adrenaline. I use it not only to check vomiting, but generally in many cases of gastritis from whatever cause. In inoperable carcinoma of the stomach, used with morphine, it gives astonishing relief.

As a corollary to this use of carbolic acid as a gastric sedative, I have recently begun to use it as a sedative expectorant, with promising results. It is well known that a large number of sedative expectorants appear to act reflexly from the stomach, and I have found carbolic acid no exception to this rule. No doubt the favour in which it was once held in cases of phthisis was the result of this action. Since it is so effective an anti-emetic, I have found it particularly useful in combination with ipecacuanha, as it is possible to give unusually large doses of the latter in this way, without producing vomiting.

Sodium Sulphate

And here I leave my old friend carbolic acid, and introduce another trusted ally in a new guise, sulphate of soda.

Sodium sulphate, or Glauber's salt, is of course a very old acquaintance. As a saline aperient, and particularly from its effect upon the secretion of bile, it has, I

suppose, been used from prehistoric times. As one of the contents of various mineral waters it was certainly taken by the Romans in our own country.

But just as I have found that carbolic acid, which was used externally, has valuable internal actions, so I now regard sodium sulphate, originally only used internally, as a most important external agent. Here again I do not wish it to be thought that I am claiming to have made a discovery. But I do think that as a profession we have been so led away by the search for new and complicated antiseptics that we have neglected certain lessons which our extensive experience of septic wounds in the war should have taught us. I refer to the use of hypertonic saline solutions. I know that many of us do utilize this principle in various ways: hypertonic saline baths, usually of magnesium sulphate, are in general use for severe cellulitis ; a paste of powdered magnesium sulphate and glycerin is used for boils and carbuncles ; more recently, crystals of the same salt have been used to pack the external auditory meatus in otorrhoea ; and so on. But to my mind these various uses of the fluid-absorbing or osmotic action of a saline solution concentrated beyond that of the body fluids only touch the fringe of a really revolutionary outlook in the treatment of infected wounds.

An Ancient Principle

Yet this principle is not merely ancient ; it is older than the human race. Why is it that a wound received by a dog or cat practically never becomes septic, unless on the head or neck? Because wherever their tongues can reach, such animals will lick a wound, not for a few minutes, but by the hour. Do not we instinctively perform a corresponding action, and if we hurt our fingers (the parts of our bodies most exposed to injury since we protected our feet), do we not instinctively put them to our mouths? Wherein, then, lies the antiseptic virtue of the saliva? It is not principally in the moisture or the warmth, for, contrary to the teaching when I was a student, a plain fomentation does little to help a wound infected with an organism of any virulence. It is certainly not due to any bactericidal properties of the saliva, which we know to be itself swarming with bacteria of all descriptions.

I suggest that it is the minute difference in concentration of the saline constituents of saliva and of " lymph " which enables the majority of mammals to deal successfully with infected wounds by artificially assisting their own internal powers of resistance to invading organisms.

Theory of Hypertonicity

I should like, before proceeding to describe my own practice in this matter, to theorize a little further. In the first place, saline solutions, even in great concentration, are not bactericidal.

I performed some experiments microscopically with our old friend *Bacillus coli*, which is readily available in a large proportion of the urines we examine. He continues his gay twirls and spins and pirouettes indefinitely in solutions of mag. sulph. or sod. sulph. to the point of saturation. The effect of hypertonic saline on infected tissues can only be that of the promotion of the flow of lymph in the direction of the surface to which it is applied.

This idea, of course, preceded the application of the principle of concentrated saline solutions. Bier's cups were in use for boils and carbuncles twenty-five years ago, and very effective they were, if rather painful. But why have we not carried this principle to its logical conclusion?

How is it possible to co-ordinate two opposing principles in the matter of dealing with invading micro-organisms—namely, the principle that lymph should flow from within outwards to check and kill the bacteria which are invading the tissues ; and the principle that antiseptics should be applied to the surface of the wound, in the hope that they will in some way flow from without inwards and catch up and kill the bacteria? I suggest that the latter idea is entirely fallacious, ineffective, and wrong, and that when once the bacteria have penetrated into the tissues no antiseptic can follow after and destroy them.

An Axiom

I wish, therefore, to formulate the following axiom, which has not, I think, been put into so many words before: that *an antiseptic, as applied to living tissues already invaded by micro-organisms, depends for its efficacy entirely on whether it is hypertonic or not.* That is to say, that it is good or bad according to whether it promotes the natural flow of lymph towards the infected area or whether it actually assists the microbes which it cannot reach in sufficient concentration to kill, by pushing them further into the tissues owing to its hypotonicity.

Since writing the above lines I noticed a paper in the *British Medical Journal* of May 11th, 1935, on " The Conservative Attitude in the Treatment of Acute Pyogenic Infections." The author is particularly concerned (and I entirely agree with him) in avoiding unnecessary incisions. He also advocates hypertonic salt compresses. But he places great reliance on heat, which I have found quite unnecessary ; and that the essential principle which I have enunciated has escaped him is evident from his support of holding a wounded finger under a hot-water tap. In my view the hypertonicity of one's own saliva would be far preferable to the hypotonicity of water, even if sterile.

The axiom which I have formulated is not incompatible with the recently introduced method of treating infected wounds with plain rubber adhesive plaster. The idea stated to be at the bottom of this method is that it is safe to leave the bacteria to stew in their own juice, so to speak. Surely a confession of impotence! I am not denying that it has proved moderately effective in many cases. But in so far as this treatment has proved beneficial as compared with the old antiseptic idea, I suggest that this has been simply because it has at least removed the actual hypotonicity of most of our antiseptics. It thus, at any rate, allows the resisting forces to entrench themselves behind the wall of infiltrated tissue which is the first sign of inflammation. But if the correct treatment were always immediately adopted when a wound which might be supposed to be infected has to be dealt with, it should be possible to check the invasion from behind, and to prevent the necessity for any inflammatory reaction at all.

Sodium Sulphate In the Treatment of Wounds

In my own practice I have endeavoured to carry this theory out for a number of years, with a success which has convinced me that it is the only tenable one. Experimenting first with magnesium sulphate, which I found rather irritating, common salt, which is more so, and potassium chlorate, which is liable to cause sloughing of the tissues, I finally settled on sodium sulphate, the presence of which is well borne both by the exposed tissues and by the surrounding skin. I tried glycerin, but found that it desiccated the surface of the tissues, leaving the deeper parts unaffected. It was also irritating. After tentatively combining a hypertonic solution of sodium sulphate with various antiseptics not incompatible with it, I eventually carried the method to its logical conclusion, and dispensed with them altogether. So now for a period of eight or nine years I have practically

banished ordinary antiseptics from my surgery, and treat all wounds not made under conditions of surgical asepsis (and how many such wounds occur in general practice as compared with possibly infected wounds?) with a dressing of hypertonic solution of sodium sulphate. I use 12 per cent. solution, which is just off saturation at ordinary temperatures. The method of application varies a little according to the situation, type, and condition of the wound. I use plain lint soaked in the solution and applied to the surface of any ordinary fairly open septic wound.

This is covered with oiled silk or elastic adhesive plaster, and bandaged. I have found no advantage whatever in applying the dressing warm. The patient is instructed that at all costs he must keep the lint soaked with the solution. The lint is changed twice a day or more often according to the amount of discharge, if any.

The effect of this method of treating septic wounds is quite astonishing. One of the first and almost immediate symptoms is the relief of pain. The pain of an infected wound is due to the pressure on the nerves of the surrounding tissues caused by the exudation with which an attempt is being made to stem the invading army of microbes. As the hypertonic saline solution begins from behind to cause this army to retreat and flow in the opposite direction, followed by the exuded lymph, this pressure is immediately relieved, and the feeling of comfort and well-being in the affected part is most marked. All the signs of inflammation rapidly disappear, and within a very short period (usually twenty-four hours if no deep infection has occurred) the wound is clean and ready to heal. At first I used then to substitute an ointment dressing for the saline. But after a few relapses I have found that a wound will heal without undue granulation under the saline dressing as a rule. If one is anxious to utilize the closed method by applying plain rubber adhesive plaster this can safely be substituted now, and is quite effective. I have seen too many unfortunate results to have any regard for it as a method of treating wounds while still inflamed.

If a wound is fairly clean or very superficial, I not infrequently apply a gauze dressing soaked in the hypertonic saline, without oiled silk, and allow it to dry on the wound. This one application is often effective. As a way of treating sepsis in burns (a complication not uncommon after tannic acid) I find hypertonic saline dressings excellent.

When called upon to treat a fresh incised or lacerated wound which it is proposed to close immediately, I do then have recourse to an antiseptic as a preliminary to closing it. Iodine is, of course, very popular for this, and is rapidly diffused ; yet here again we have our old friend carbolic acid, which probably damages the tissues less than iodine, and has the definite advantage over any others in being quite an effective local anaesthetic. I find that a pad of wool soaked in 1 in 20 carbolic and placed in the wound while one prepares the clips or sutures, makes the subsequent operation of closing very much less painful than it would otherwise have been. Having closed the wound, I soak a pad of gauze in the sodium sulphate solution, bandage or strap it to the wound without any oiled silk, and allow it to dry on. I am then perfectly prepared to guarantee to the patient that the wound will heal by first intention.

As I have mentioned, I have now been carrying the hypertonic theory to its logical conclusion over a period of years, and have had quite remarkable success with it. I have used it in all cases in the York Fever Hospital to which it could be applied, and naturally we have many septic conditions there. In the case of a boil or an abscess, the moment it has broken through or been incised, the hypertonic dressing clears it up at once, and except in a very deep abscess it is rarely necessary to insert a drain.

So effective have my patients found the " lotion " with which I supply them, that I frequently find that they have treasured the remains of a bottle of it for years, to use on future wounds ; and of course not infrequently they will apply it to an unbroken inflamed surface, in the vain hope that somehow it must do good. Alas! are not some of our own activities as difficult to justify logically?

Two Cases Treated with Sodium Sulphate

Before leaving the subject I will briefly describe two interesting cases which occurred in my practice last year. I have selected them as instances of utterly different types of septic wounds.

The first case was that of a young man, aged about 20, who had some two days before I saw him suffered a deep penetrating wound of the sole of the foot from treading on a nail. The wound itself was about the middle of the mid-tarsal region, and admitted a small probe almost vertically upwards for rather more than an inch. There were signs of intense infection. The dorsum of the foot was red and oedematous. There was oedema also above the ankle. The inguinal glands were very large and tender.

There was lymphangitis up the front of the leg. The temperature was 101.5°. There was, of course, much pain. I kept the leg still and at body level in bed ; and I applied the sodium sulphate 12 per cent. dressing as I have described, insisting that the pad of lint on the wound should be kept soaking wet with the solution. Had the wound been larger I should have inserted a small gauze drain, for I hardly dared to hope that the hypertonic saline applied to so small a punctured wound could be effective. By next day the patient was easy, and all the signs were abating. The temperature was normal. In three days there was nothing to be seen but the small wound of entry, clean and healing.

I could cite innumerable such cases but I have described this one at length because it looked at first so hopeless to expect results. From it and similar instances I deduce that the hypertonic solution is effective when applied to the surface of punctured wounds, however small ; and indeed, I find that so long as the wound is actually visible and patent, even a pin-prick will yield results.

The other case I have chosen was that of a young girl, 17 years of age, who on July 13th, 1934, was knocked down by a runaway horse. She was dragged under the cart, a light lorry, for a considerable distance. There was an extraordinary amount of skin missing. Practically the whole of the face was abraded down to the deeper layers of the epidermis. Both arms and both legs were similarly abraded on the outer surfaces. There was only one fairly deep cut on the left knee ; but the outer side of the right ankle was scraped right through to the periosteum. There was no skeletal damage except a sprained ankle and wrist, and, of course, innumerable contusions. I need hardly say that the whole of the abraded surface was filthy to a degree, the dirt being rubbed thoroughly in to the exposed tissues. The girl was suffering badly from shock. I gave her morphine and pituitrin ; I debated whether to attempt a cleaning-up process ; but she was so ill that I decided to defer it, and meanwhile to get going at once with the sodium sulphate lotion.

I therefore used no antiseptic of any sort whatever, and did not for the time being even attempt to remove any dirt, but applied sheets of lint soaked in 12 per cent. sodium sulphate solution, with instructions to keep the lint soaked but not to remove it. The effect in relief of pain was immediate and remarkable. I left the patient that night quite comfortable. I turned over in my mind the question of anti-tetanic serum ; but in view of the entirely superficial and exposed nature of the wounds I decided that an anaerobe such as the *Bacillus tetanus* could hardly flourish there, and did not give it. Next day when I went round I was, I admit, astonished to find not a vestige of pus at any part. The patient was almost free from pain, except in the sprains and contusions. The temperature was normal, and all signs

of shock had gone. The abraded surface was perfectly healthy and not inflamed. Much of the dirt came away with the lint when I removed it. I therefore decided to continue the experiment of doing absolutely nothing apart from applying the lotion in lint.

To be brief, it was a brilliant success. At no time was there any inflammatory reaction or pus in the skin injuries. A few sterile sloughs separated where the damage had been deepest. The only sign of inflammation occurred a week later, when one of the contused areas, on the dorsum of the right foot, became inflamed. This had no absorptive relation with any broken surface, as there was no epithelium missing below the ankle. It settled down without suppuration under treatment with kaolin paste.

No excessive granulation took place at any part, and all except the two or three deepest injuries were healed by August 2nd, twenty days after the accident.

I saw this patient recently in connexion with her claim for compensation. In spite of the fact that I never actually removed any of the dirt in the wounds, all the scars are clean and free from enclosed particles of foreign matter. I attribute this result, and the successful course of the case, to the fact that from the very beginning the flow of lymph was kept continuously outwards ; and I do not think any other explanation is feasible.

And here I leave my subject. I have endeavoured to put in a plea for the old drugs, that they should sometimes be given a trial in new ways. I have served my purpose if I have shown that there may be already on our dispensary shelves, perhaps reposing in a dusty corner, neglected and forgotten, substances potent and effective in quite unexpected directions.

EPIDEMIOLOGY OF SUMMER DIARRHOEA

[FROM A MEDICAL CORRESPONDENT IN BERLIN]

The summer peak of infant mortality, mainly due to an excess of diarrhoeal cases, used to be a familiar epidemiological feature. One could pick out a hot summer by the height of the peak. The year 1911, for instance, will be remembered for its glorious summer. In that year the rate of infant mortality in the second quarter of the year in England and Wales was 91.7 per 1,000 births ; in the third quarter it was 201.1. The following year, less agreeable to holiday makers, we had in the second quarter a rate of 88.0, and in the third 79.5. Similar figures could be quoted from other European countries. Since the war this summer peak has almost disappeared. In the hot summer of 1921 there was still evidence of its existence ; in that year the rates in the second and third quarters were 67.5 and 81.9 as compared with 80.7 and 53.8 in the following year.

Seasonal Variations in Mortality

More recent figures in most countries show that the summer peak has practically gone and is replaced by a less lofty winter peak. In a paper published this year (*Virchows Archiv*, 1935, ccxcv, 343), Gottstein has studied the history of the summer peak, particularly on the data of Hamburg, with the interesting result of finding that it was not apparently present in European experience before the arrival of cholera Asiatica. Gottstein has compared the monthly mortalities of infants in German cities, and finds that the summer maximum first appeared about a century ago, that in earlier times the summer mortality was often a minimum. The same feature appears in the well-known work of Quetelet, whose classical treatise on social physics appeared in 1836 (*Sur l'Homme et le Développement de ses Facultés*). Quetelet dealt with monthly variations of mortality, and Gottstein, using Quetelet's data for Belgium, 1815–26, shows that there was a winter but no summer maximum. On the other hand Virchow, in his paper on the mortality ratios of Berlin published in 1872 (*Berl. klin. Woch.*, 1872, ii), pointed out the existence of an enormous summer maximum for the mortality of young children. Of course this did not apply to the mortality of adults, for which the winter maximum still persisted. Gottstein points out that the summer maximum for the mortality of children did not exist between about 1750 and 1840, then became more and more prominent, reached a maximum, and has since disappeared. "The summer peak manifests itself as an epidemic phenomenon confined to a long period of time with a rise, decline, and fall, exhibiting a unitary clinical phenomenon."

Factors Influencing the Summer Peak

Many possible factors of the excessive mortality of infants in the summer have been invoked—infection of milk, intestinal infections, etc.—some of which have certainly been mitigated by modern hygienic improvements. Many of them, however, must have been operative when the summer peak was not present, even if due weight is given to the probability that a century ago a much larger proportion of infants were breast-fed. Gottstein has therefore invoked other factors, and, in particular, the epidemiological parallelism of Asiatic cholera and cholera nostras (to which Sticker drew attention in his well-known treatise). Gottstein has used the excellent data of Hamburg, which extend back to 1820. The first pandemic period of cholera is usually reckoned from 1817 ; the next 1831–7, the third 1848–50 and 1853–9, the fourth 1866–7, 1871, 1873, and finally the period 1892–3 ; in 1892 alone 8,616 deaths occurred in Hamburg. Gottstein has followed out the curve of summer mortality (July, August, September) from 1821 to 1933, separately for ages under and over 1 year. The excess mortality, whether from cholera Asiatica or cholera nostras, fell on one of these months. The striking peculiarity of the curve of infant mortality is that, excepting a small rise in 1826, infant mortality had no summer peak before the irruption of the exotic cholera. The curve is not continuous, but corresponds closely to the movements of the mortality rates of persons over 1 year in age. Often the elevation of the infant mortality appears a little earlier than that of later age mortality, and persists longer. When instead of comparing the mortalities as percentages of the yearly mortality the more correct and laborious method of using actual rates of mortalities is employed the same result emerges. It is clear that, in Hamburg, the summer peak of infant mortality only showed itself after the irruption of Asiatic cholera in 1833 and, since the disappearance of Asiatic cholera, has gradually disappeared.

An Unknown Quantity

Naturally there is no possible question of a common *materies morbi* in the biological sense ; the epidemiological relationship made manifest by Gottstein, whose painstaking and suggestive studies deserve great praise, must be due to epidemiological *tertium quid*, which remains to be discovered. It is a good illustration of the truth which the late Dr. John Brownlee often emphasized—namely, that biological disparities ought not to exclude the search for epidemiological affinities.

M. Steinbruck (*Zentralbl. f. Chir.*, August 24th, 1935, p. 1995) recalls that after failure of artificial respiration temporary return of automatic breathing has followed puncture of the cerebral ventricle and injection of caffeine. In two cases—in one with complete success, although the patient died twenty-two days later from bronchopneumonia—he has done suboccipital puncture and injected 10 c.cm. of 10 per cent. caffeine solution into the cerebello-medullary cisterna: subsequently the head was lowered and the buttocks were raised. The successful case was one of dilaudid poisoning which had failed to improve with lobeline, cardiazol, or O_2–CO_2 administration. Lobeline also is suitable for trial in similar cases: the stimulant action of both lobeline and caffeine may be connected with the acidity of the solutions in which they are commonly made up.

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URINARY INFECTIONS

It is a matter for regret that the question of chronic infections of the urinary tract has received so little consideration and investigation until recently. It has long been known that an acute pyelitis, usually due to the *Bacillus coli*, tends to get well after the administration of alkalis followed by a course of urinary antiseptics, but many wondered whether the cure was the result of the treatment prescribed or was really due to the action of the defensive mechanism of the body. If the infection became chronic many considered it to be incurable, while others complained of the inefficiency of the treatment of infections in general and of those of the urinary tract in particular. The introduction of the ketogenic diet, for which we are indebted to the Mayo Clinic, may be regarded as the first decisive action in the campaign against chronic *B. coli* infections. It has since been shown that the "ketonurine" resulting from this diet owes its efficiency to the presence of β-hydroxybutyric acid, but as this acid is very unstable it is not suitable for oral administration. Recently Rosenheim has advocated the oral administration of mandelic acid in the treatment of these infections. This acid is stable, and as it is foreign to the body it is excreted unchanged in the urine. It is too early to speak in an authoritative manner on the value of this remedy, but reports are steadily accumulating which show that in many cases it has a real effect. There are still many others in which drug treatment is unsuccessful. The want of success is due to a variety of conditions. In the first place, there may be a repeated or a continuous absorption of bacteria from the intestinal tract, with reinfection of the urinary organs. In the second, there may be a local condition in some part of the urinary tract which keeps up the infection indefinitely. In the third, the treatment is ineffectual either because the drug employed had little or no action or else because it was wrongly administered. Much light has been thrown on these points by a series of papers in the current issue of *St. Bartholomew's Hospital Reports*.[1]

This series opens with a paper on the "Anatomy and Physiology of the Kidney and Ureter" by Mr. A. M. Boyd. He follows Traut's description of the structure of the kidney, of which he gives an excellent account. The remainder of the paper is taken up with practical points concerning the vascular supply, and the lymph drainage, etc., of the kidney and ureter. In a paper entitled "The Relation of Constipation to Persistent *Bacillus coli* Infection of the Urinary Tract," Dr. Geoffrey Evans stresses the evils arising from the abuse of purgatives. He quotes cases in which a chronic urinary infection cleared up as soon as the action of the bowels was properly regulated. He does not, perhaps, lay enough emphasis on the importance of focal infections of the intestinal tract, such as appendicitis or cholecystitis, as predisposing factors. Yet many cases of persisting or recurrent pyelitis are secondary to such a focal infection, and are only cured when the primary lesion is dealt with surgically. However, he gives valuable instructions for the management of the intestinal tract, which is a most important point in the treatment of these cases. The surgical aspect of urinary infections is ably dealt with by Mr. Girling Ball in a paper entitled "An Investigation into the Causes of Persistent Infections of the Urinary Tract." In a series of fifty adult patients examined for persisting pyuria one side of the upper urinary tract was involved in thirty-one, both sides in fifteen, while the bladder alone was involved in four. He also investigated twelve cases of urinary infection in children, in all of which either one or both kidneys were infected. Associated lesions, usually of the obstructive type, were found in all but three of the adult cases of unilateral involvement, and in approximately half of those in which the disease was bilateral. These findings will not come as a surprise to urologists, but they are valuable inasmuch as they emphasize the necessity of making a complete examination in every case of prolonged pyuria. It is only then that a satisfactory line of treatment can be instituted. "Urinary Infections in Pregnancy" is the title of an interesting paper by Dr. J. Beattie. After describing the changes produced in the urinary tract by pregnancy, he discusses the relation of albuminuria to infection. He points out that albuminuria found in a non-catheter specimen is not necessarily of any significance, for out of seventy-two patients observed in the ante-natal clinic with albumin in specimens passed naturally only forty-five were found to have albuminuria when catheterized, and of these twenty had organisms in the urine. Out of 100 patients examined in the first stage of labour, seventy-two had albumin in a catheter specimen, and in twenty-two of them the urine contained organisms. *B. coli* was found in thirty-four of the forty-two infected cases, and pyogenic cocci in the remainder. These figures show that a urinary infection is exceedingly common during pregnancy, and it is fortunate that cases of severe pyelitis are not more frequent.

The last and in many ways the most interesting paper in this series was written by Dr. L. P. Garrod, and is entitled "A Study of Urinary Antiseptics"—a subject lately discussed in the Section of Pharmacology at the Annual Meeting of the British Medical Association in Melbourne.[2] Dr. Garrod records an experimental investigation of the therapeutic value of certain of these drugs. The method employed was to give the drug to be tested to healthy individuals, usually convalescents after operation, and to collect a twenty-four-hour specimen on the third day. This urine was

[1] *St. Bartholomew's Hospital Reports*. Vol. lxviii. Edited by Lord Horder and others. London: John Murray. 1935. (21s.)

[2] *British Medical Journal*, October 19th, 1935, p. 750.

sterilized by filtration, and its acidity was adjusted to *p*H 6.0. One hundred c.cm. was placed in a sterile flask, warmed to 37° C., and inoculated with a fixed dose of organisms. The flask was then placed in the incubator, and subcultures were taken once an hour for the first six hours, and again at the end of twenty-four hours. The number of colonies in each subculture was counted, and the number of organisms in each 1/2 c.cm. of the urine was calculated. Two experiments were made from each sample, one against *Bacillus coli*, and one against *Staphylococcus aureus*. Controls from samples taken before the administration of the drug showed that both these organisms multiplied in normal urine at a fairly constant rate. On the other hand, hexamine and some of its derivatives were the only drugs which constantly rendered the urine sterile at the end of twenty-four hours. The number of organisms steadily diminished during the first six hours, but complete sterilization was only effected somewhere between the sixth and the twenty-fourth hour. The results obtained with hexyl-resorcinol and pyridium both showed an initial fall in the number of organisms, which was followed by a rapid growth, so that at the end of the experiments the urine contained many millions of organisms per 1/2 c.cm. It is difficult to say how far experiments of this nature can be applied to an infected urinary tract, but so far as they go they tend to show that hexamine is the most reliable urinary antiseptic we possess at the present time. One cannot expect any result from it if the urine is alkaline, as no formalin is liberated at a *p*H of 7.6 or higher, nor can one expect much from the addition of acid sodium phosphate, as this drug only increases the "total acidity," and has little action on the hydrogen-ion concentration. The latter, however, is increased by acidifiers such as ammonium chloride. Lastly, litmus is an unsatisfactory indicator, because it does not show the *p*H. Chlorphenol red has been suggested by Osterberg and Helmholz for testing the urine of patients on a ketogenic diet, and might be used equally well as an indicator for patients taking hexamine.

IMMUNIZATION AGAINST DIPHTHERIA

So many prophylactics have been evolved in an attempt to obtain high protection against diphtheria without causing undue discomfort that it is well to review progress periodically. Opportunities in England for controlled continuous clinical investigation, like that of Dudley at Greenwich, into methods of immunization against diphtheria are limited; the review of a campaign by Dr. E. H. T. Nash and G. Bousfield at Isleworth[1] is therefore to be welcomed. Dr. Nash in 1930 decided to use, over a period of at least five years, the method which at that time he considered to offer best the advantages of freedom from reaction with the production of satisfactory immunity. At first the authors gave three injections of 1 c.cm. of toxoid-antitoxin mixture, T.A.M., the intervals being seven and fourteen days. About 90 per cent. of children had become Schick-negative when retested three to four months afterwards. Later, the third dose was increased to 1.5 c.cm., and of 1,142 children only 5 per cent. failed to become Schick-negative without one or more further injections. The authors emphasized the need of Schick testing before and after immunization. Amongst 4,287 children they found only two, a brother and sister, who could not tolerate the inoculations; there may be some degree of serum sensitization, but this does not seem to be of any serious importance; 95 per cent. of children naturally negative and 93 per cent. of those immunized retained the Schick-negative condition when tested about three years later. There has been no death from diphtheria amongst the 4,287 children; there have been only two mild cases in immunized children believed to be immune, and one mild attack in a natural Schick-negative child. The authors favour immunization of children less than 5 years of age, and were highly successful in obtaining children in this age group, and apparently in maintaining their attendance, largely because very few objectionable reactions were met with.

Dr. D. J. Thomas of Acton[2] during the past three years has inoculated some four thousand children with toxoid-antitoxin mixture, or—for infants—formol toxoid. Of the two thousand tested later 95 to 99 per cent. were negative; five "very mild cases" of diphtheria occurred among those who gave a negative response after inoculation. Dr. Thomas gives an impressive account of the virulent type of diphtheria prevalent—death occurring within twenty-four hours of the first symptoms noticed by careful parents. It is reassuring to find that, in many isolation hospitals—Leeds, Birmingham, Edinburgh, Aberdeen, and others—notwithstanding the prevalence of the severe form of diphtheria observed recently in the North, immunization has continued to provide almost complete safety for the nursing and ward staffs.

The ideal method of immunization is obviously that which will with one injection or two be so free of reaction and give such high immunity that ordinary Schick-testing and post-inoculation Schick testing can be dispensed with—except in occasional samples of the population—in the confident knowledge that almost the whole of the people inoculated become Schick-negative within a reasonable period. There are numerous reports showing that one injection of washed alum precipitate of toxoid may give a high percentage of conversion to the Schick-negative condition. In our present issue Drs. M. Naughten, J. H. White, and A. Foley show percentages of 90 to 95 eight weeks after injection, and Dr. J. E. Haine records 91 and 93 per cent. at nine weeks. The early American hope that a single injection, the so-called "one-shot" method, would convert almost 100 per cent. of Schick-positive children to a Schick-negative condition within a few weeks has been modified with increasing experience. The truth is probably that this effect is obtained only where the

[1] Annual Report, 1934.

[2] Annual Report, 1934.

natural Schick-negative rate is high—in other words, where the Schick-positive children have had many opportunities of contact with the diphtheria bacillus, and so have a slight but all-important basal immunity. But where this is absent, where the children in an isolated community have had little acquaintance with the bacillus, they may be considered as almost at "absolute zero," far below even the ordinary Schick-positive level, and here one dose of alum toxoid may convert only 65 to 70 per cent.[3] or 79 per cent.[4] in three to seven months. If it is decided to use one injection in a campaign, clearly one must control the effect by some check testing after inoculation. It has long been known that two spaced injections give better immunity than one, and recent experimental work on animals as well as on small groups of children has yielded the same result. In New York[5] the routine method suggested is to give an initial injection of 0.1 c.cm. of alum toxoid followed by 0.5 c.cm. some two weeks later. This resembles the English practice of giving a first injection of 0.1 c.cm. as Chesney's "detector" dose—that is, to identify those uncommon individuals who are likely to suffer undue local pain after the inoculation. A committee reporting in the *American Journal of Public Health*[6] also recommends a similar course of two doses.

A reading of the available literature indicates that alum precipitate of toxoid is already establishing itself firmly, and one can, without much risk, prophesy that within the near future this prophylactic, certainly for children under 8 and probably for all of school age, will largely oust others. The more courageous medical officers and those in districts where the parents believe that an absence of "local reaction" proves lack of virility in the prophylactic—for such exist—will use one dose of 0.5 or 1 c.cm., at least for children under 8. Cautious workers will give an initial dose of 0.1 c.cm. two or three weeks before the main dose to children and even to adults, in special cases testing the latter for sensitivity by the Moloney method first. A few of the "one injection" enthusiasts will encounter the rare severe reaction, or the more rare minute sterile abscess described by Dr. Naughten, and will then transfer to a "two-dose" method.

[3] Volk, V. K.: *Amer. Journ. Pub. Health*, April, 1935, xxv, No. 4, 430.
[4] *Journ. Amer. Med. Assoc.*, 1935, cv, 889.
[5] *Quarterly Bulletin*, New York Department of Health, 1934, ii, No. 1, 8.
[6] *Amer. Journ. Pub. Health*, 1935, xxv, 71.

UP-TO-DATE THERAPEUTICS

Old customs die hard. This adage is, perhaps unfortunately, just as applicable to the bulk of the medical profession as it is, dare we say, to members of the sister professions of the Law and the Church. One does not wish to decry for one moment the magnificent advances made during the last twenty years in all branches of medical science, but it is true that most practitioners are rather slow in adopting certain small refinements in the art of therapeutics which may mean a great deal in promoting the comfort of their patients and in mitigating some of what might be called the minor horrors of treatment. These reflections have been prompted by the report of a clinical lecture given by Dr. Bernard Fantus of Chicago on "Advances in Therapeutic Technique."[1] He thinks that even in these days of the aeroplane, the telegram, and the radio there still exists too great a time lag between the announcement of a valuable idea and its acceptance by the rank and file of the medical profession. In the matter of dressings, for instance, it is a highly rational principle that clean wounds need no absorbent dressing, since there is nothing to be absorbed, yet everywhere dry absorbent dressings are still being piled inch-high on clean operation wounds. Early in 1934 B. J. Golden described a copper gauze dressing that promised to be superior to the conventional dressing from every point of view, including that of economy. In August of the same year John E. Cannaday described a wire screen dressing that allowed exposure of the surface to air and light, thus hastening healing while saving a great deal of time and dressings. Again, there is now a washable adhesive plaster that should supersede the old variety, which had no waterproof backing. Dr. Fantus refers to the treatment of varicose ulcers by the application of elastic adhesive plaster, as described by Dickson Wright in this *Journal* in September, 1931, and comments favourably upon the use of non-adhesive elastic bandages for the support of varicose veins. He believes that they should be used as a routine measure for the prevention of varicosities in pregnancy. Another field of medicine in which progress is particularly slow is that which requires the co-operation of the prescribing physician and the dispensing pharmacist. Ointments, for example, should be put up in collapsing tubes instead of in pots or boxes, and this is particularly desirable when applications are to be made to any of the mucous membranes. Until collapsible tubes with tips suitable for application to the rectal mucous membrane are more generally available, the suppository would, according to Dr. Fantus, remain the most important type of rectal administration. The modern suppository should be streamlined like a motor car, with the blunt end rounded: if this end is inserted first, once it has passed the sphincter the rest slips in easily—is, in fact, almost sucked into the rectum. Dealing with the oral administration of drugs, Dr. Fantus would make it an unpardonable sin to insult the palate of a child with "nasty medicines," and in this connexion he explains how such drugs as quinine, strychnine, dilute hydrochloric acid, and so on can be artistically disguised. A further hint runs: "For ingestion by the mouth encapsulate everything that can possibly be given in that form: capsules combine tastelessness with permanence, portability, and efficiency." In hypodermic medication ampoules containing multiple doses are recommended as forming a considerable economy compared with the single-dose ampoule. It is permissible to point out, however, that in favour of the latter is their convenience and the greater margin of safety from the risks of contamination. Dr. Fantus discusses the use of sclerosing solutions in the treatment of varicose veins, hydrocele, and the cure of reducible hernias, subjects which have all received recent atten-

[1] *Journ. Amer. Med. Assoc.*, September 14th, 1935, p. 877.

tion in these columns. Finally he touches upon the injection of alcohol in the symptomatic treatment of pain, as, for instance, in certain cases of carcinoma. He recommends that constant and intractable pain should be considered as an indication for nerve block somewhere in the afferent tract rather than for the indiscriminate administration of analgesics. Dr. Fantus makes no revolutionary suggestions, nor, indeed, has he explored ground with which most of his readers are unfamiliar: at the same time, he has written a stimulating and thought-provoking paper with the bulk of which most practitioners would probably agree. He admits himself that many of the advances he has discussed still lie in the future; where this is so, time alone will prove whether they are in fact advances or only passing fads.

RADIUM IN BLADDER CARCINOMA AND EYE CONDITIONS

The annual report of the Radium Institute, London, for 1934 includes a medical review in which, in addition to the group of cases tabulated last year, the results of treatment of carcinoma of the bladder and of certain eye conditions are given for the first time. Before 1927 a few cases of bladder carcinoma had been treated by the passage along the urethra of a radium-bearing sound, which was left in position for various periods. Haematuria was sometimes lessened, or even arrested, but there was no real control of the disease. In the year mentioned vesical growths were first treated by the insertion of seeds through a cystoscope; the method gave good results in some cases, but it has become clear that it should be restricted to small primary growths, to small recurrences after radium or partial cystectomy, and to cases where age and the general condition render the suprapubic approach dangerous. In all other cases the insertion of radon seeds by this route seems to offer the best chance of controlling the disease. Accuracy of implantation is assured, and only by this means is it possible to discover the degree of infiltration of the bladder wall and to plan the radiation field accordingly. The seeds can be left in position permanently and the bladder sutured without drainage; the bladder often heals by first intention, shortening the period of convalescence. The results of treatment were published in the *British Medical Journal*, 1934, vol. ii (p. 584). It is now added that although a painful bladder spasm may follow, especially in big growths where the number of seeds is large, the patients do not suffer unduly, many being quite free from any of the unpleasant effects so often attributed to the use of radium in this part of the body. In addition to the treatment of rodent ulcer, epithelioma, and other skin lesions affecting the eyelids, radium has been employed increasingly in conjunctival epithelioma, melanoma, and corneal ulceration. Twenty cases of epithelioma situated in the limbus have been treated since 1925, at first by unscreened applications. During the last three years certain cases have been treated by interstitial radiation by means of seeds introduced beneath the tumour by incising the conjunctiva outside the tumour edge and gently pushing the seed into the required position. Lightly screened seeds of high intensity are used, their length varying with the size of the tumour. The seed is withdrawn by traction on the attached thread after periods of radiation ranging from ten to eighteen hours, during which time the eye is kept bandaged and the patient is quieted with morphine or hyoscine. The results have so far been good, and the reactions slight. Eighteen cases of pigmented tumours have been treated by radium since 1925 on the same lines as those employed for other limbal tumours. All the patients are alive and well. Radium has given excellent results in several cases of Mooren's ulcer, and unscreened radiation has now been shown to benefit slowly spreading corneal ulceration which does not yield to other forms of treatment.

INFECTIONS FROM BLOOD TRANSFUSION

Transmission of infectious disease by blood transfusion must be of infrequent occurrence, and it is of interest to note a recent report of two fatal cases by T. M. Beckman[1] of Stockholm. The first patient, who was suffering from pernicious anaemia, was given 300 c.cm. of blood provided by his nurse, who belonged to the same blood group. He lost consciousness on the day after the transfusion, which was followed by continuous fever (104° F.), and died five days later. The donor, who had apparently been quite well at the time of the transfusion, experienced slight malaise after it, and her temperature was 99.5° in the evening of the same day. Next morning her temperature was 102°; her throat was very red and yielded a pure culture of staphylococci. Twenty-four hours after the transfusion she had a fully developed tonsillitis. In the second case, which terminated fatally fifteen days after the transfusion, the donor developed severe chicken-pox, with a temperature of 102°, three days after the transfusion of 300 c.cm. of blood. In this case also loss of consciousness set in soon after the transfusion, with well-marked signs of cerebral involvement, suggestive of acute encephalitis. In neither instance had there been any technical error in the execution of the transfusion, and there could be no question of incompatibility from faulty blood grouping. According to Beckman, the lesson of these cases is that the blood of would-be donors should be most carefully examined. He does not, however, say what examinations of the blood should, in his opinion, be undertaken to avoid such tragedies in the future.

HERNIATION OF INTERVERTEBRAL DISK INTO SPINAL CANAL

Since the publication of Schmorl's work on the pathology of the intervertebral disks a number of earlier observations on certain obscure spinal conditions have been correlated and assigned a definite place in our knowledge of diseases and injuries of the spine. In a recent paper[2] Mixter and Ayer state that compression of the spinal cord by fragments derived from the intervertebral disk was described as long ago as 1911, both in this country and in America—chance observations, almost forgotten. During the last six years the condition has received much attention, and this most recent contribution marks a further advance in that the authors have recorded cases in which compression

[1] *Acta Chir. Scand.*, July 8th, 1935, p. 615.
[2] Mixter, W. J., and Ayer, J. B.: *New England Journ. of Med.*, 1935, ccxiii, 385.

was recognized in the absence of objective neurological signs. Neurologists and orthopaedic surgeons are by now aware that posterior displacement of a portion of an intervertebral disk may lead to the development of the familiar spinal tumour syndrome. A history of injury is commonly, but by no means invariably, obtained. The duration of symptoms before the patient seeks treatment is often considerable, and his chief complaint is always pain. In more than half the cases observed in the series investigated by Mixter and Ayer at the Massachusetts General Hospital the symptoms and signs were unilateral. The problem is how to differentiate these cases from those with true spinal tumours. Radiographic examination of the spine sometimes reveals a little narrowing of the disk or an arthritic spur at the level corresponding with the lesion, but these signs alone are quite inconclusive. Lumbar puncture shows a spinal block, always incomplete, and a moderate rise in the protein content of the cerebrospinal fluid—the average figure was a little under 200 mg. per c.cm. Radiography after the injection of lipiodol supplies the final evidence. As the block is always incomplete a special technique is required to give a good picture. The characteristic finding is a punched-out shadow indicating the presence of a small mass indenting the theca anteriorly. In the last ten cases dealt with by Mixter and Ayer the picture was so clear that they were able to arrive at a correct preoperative diagnosis. These herniations of the intervertebral disk are found in the lower cervical region, rarely in the thoracic, and most commonly in the lower lumbar region. The special interest attaching to this last group in the authors' series is that in more than half of their cases no clinical signs of an intraspinal lesion were present. The cases were discovered as a result of close co-operation between the neurological and orthopaedic departments. It is unlikely that these patients, who for months or years had been labelled as sacro-iliac or lumbo-sacral strain, would have found their way to a neurologist in the ordinary course of events. This happy association of neurologist and orthopaedic surgeon has resulted in the crystallization of a well-defined clinical-pathological entity out of the somewhat amorphous mass of conditions collectively labelled "low back pain." But the questions immediately suggested are: "What cases ought the orthopaedic surgeon to send to the neurologist?" and "How should the neurologist deal with them when they arrive?" Mixter and Ayer do not give a clear answer to the first question, but one gathers that a disk hernia may reasonably be suspected in any patient with lumbo-sacral or sacro-iliac pain that is not obviously due to some other cause, and that has persistently refused to yield to all the usual forms of treatment. The fact that eight cases of disk hernia compressing the theca without producing objective clinical signs were found during a period of eighteen months suggests that this lesion may prove to be more than an interesting curiosity. The first special investigation in the neurological department is lumbar puncture; and if the lesion is in the commonest situation—that is, between L4 and L5, the fluid withdrawn must come from above the lesion. Even so, the protein content is almost invariably raised a little. A positive finding calls for the injection of lipiodol, and a search is then made for the punched-out shadow so beautifully shown in the plates illustrating the paper by Mixter and Ayer. Laminectomy is the only effective treatment, and appears to give excellent results.

PURITY OF FOOD AND DRUGS

The annual report for 1934 by the Ministry of Health on the sale of food and drugs gives figures which indicate the constant vigilance that is needed to protect the public against certain forms of fraud that are peculiarly harmful. Adulteration of milk appears to be the commonest and most serious form of fraud. The public analysts examined during the year 76,930 samples of milk, and nearly 7 per cent. of these were found to be adulterated or below standard. Condensed milk, cream, butter, and cheese were all more satisfactory, for in these foodstuffs only between 1 and 2 per cent. of the samples were reported upon adversely. In the reports on miscellaneous articles of food it is interesting to note that high tannin contents were found in two varieties of tea advertised as containing little or no tannin. The results of drug analysis do not reveal any very serious adulterations except in the case of disinfectants. Lysol of the *B.P.* standard should contain 50 per cent. by volume of cresol, but samples advertised as lysol were found which contained only 3 per cent. of cresol. The general averages show 5.5 per cent. incidence of adulteration in the foods examined and just under 5 per cent. in drugs. The report is published by H.M. Stationery Office, price 3d.

On Monday next, November 11th, Sir D'Arcy Power—surgeon, medical historian, biographer, and bibliophile—will celebrate his eightieth birthday. In offering Sir D'Arcy congratulations we would like to acknowledge his many services to this *Journal*.

Dr. N. M. Josephus Jitta has succeeded Sir George Seaton Buchanan as president of the Office International d'Hygiene Publique.

The council of the Royal Society of Edinburgh has made the first award of the David Anderson-Berry Prize to Charles Melville Scott, M.B., D.Sc., lecturer in materia medica in the University of Edinburgh, for his essay "On the Action of *X* and Gamma Rays on Living Cells." This prize, which consists of a gold medal and a sum of money, was founded by the late Dr. David Anderson-Berry in 1930, and is awarded triennially to the person who, in the opinion of the council, has recently produced the best work on the nature of *x* rays in their therapeutical effect on human diseases.

The Right Hon. Arthur Greenwood, a former Minister of Health, will address the annual conference of the Incorporated Association of Hospital Officers, which opens at St. Bartholomew's Hospital on November 15th. Mr. Greenwood's paper is on "Voluntary Hospitals and Their Future."

The members of the ambulance unit the Norwegian Red Cross is sending to Abyssinia have recently been selected, and will proceed to their destination as soon as possible. One of them is the surgeon and radiologist Dr. Ulland. He will be accompanied by a senior medical student and two orderlies.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

SYDENHAM'S CHOREA

BY

C. M. HINDS HOWELL, M.D., F.R.C.P.

It may not be out of place to preface what I have to say about the treatment of this condition by referring briefly to the diagnosis. There are a number of diverse conditions which give rise to involuntary movements, and some of them may cause difficulty in diagnosis. It is important to remember that, as well as by movements, chorea is characterized by weakness and diminished tone in the muscles of the affected limbs. In some cases this weakness may be much more obvious than involuntary movement. The distribution may be hemiplegic, and, unless the child is closely watched, such involuntary movements as there are may escape observation. In cases of this type it is not difficult at first to make an error in diagnosis. The weakness in these—and also in those, by far the commoner, in which involuntary movements occur—is shown by lack of sustained effort, but in some instances it may be so pronounced as to suggest actual paralysis.

Chorea occurs much more frequently in girls than in boys, and is rarely met with after the age of 20, except in association with pregnancy (chorea gravidarum), when it is more likely to arise in first than in subsequent pregnancies, and is more common in the unmarried woman.

Tics consist of involuntary movements, but should not give rise to confusion, as the movements are co-ordinated and purposive and there is no loss of power, in marked contrast to what obtains in chorea. Hysteria may give more trouble in diagnosis, but in this disorder the movements are more stereotyped than in chorea, and other manifestations of hysteria are usually to be found (anaesthesia, etc.). In both chorea and hysteria the movements increase under observation. Choreic movements may be observed during the acute phase of encephalitis lethargica, but the ocular palsies so common in the latter are unknown in the former. Post-hemiplegic chorea (athetosis) is unlikely to cause difficulty in diagnosis. Sydenham's chorea does not occur in adults (except as chorea gravidarum), hence Huntington's chorea and the hemichorea following vascular lesions in the regio subthalamica or corpus Luysii can easily be distinguished without difficulty. A history of previous rheumatism or its association with the attack, and the presence of pericarditis or endocarditis, will serve to confirm the diagnosis.

General Management and Diet

The onset of chorea may be sudden or preceded by a period in which the child appears clumsy and drops things or else exhibits an unusual mental dullness. In treatment it is important to remember (*a*) that acute rheumatism is closely associated with the condition, and (*b*) that the basis of the involuntary movements, loss of power, speech, etc., is an encephalitis. The first point indicates the use of antirheumatic treatment, while the second imposes the necessity of quiet, the exclusion of anything likely to excite the patient, and the choice of a suitable nurse, professional or otherwise, who will not fuss or worry the child.

The child must be put to bed in a room which is well ventilated, not overheated (temperature 65° F.), and in which the light is diffused. The head of the bed should be towards the light. It may be necessary, should the involuntary movements be severe, to fix padded sides to the bed to prevent the child from falling out. In small children a wide bandage fixed across the body and secured to the frame of the bedstead may be helpful. In this as in other rheumatic conditions blanket sheets are useful in order to prevent chills, and the child's night-dress should be flannel and be changed as often as may be necessary if there is much perspiration. The room must be kept quiet, and other children and visitors excluded during the acute phase of the illness. It is important that the child should be nursed as a case of rheumatic fever, kept as flat as possible, and not allowed to exert itself in any way. It should be blanket-bathed and not allowed out of bed.

Diet should be as nourishing as circumstances permit. There are two factors to be considered in this connexion: (*a*) the patient's temperature, and (*b*) severity of the involuntary movements. If the patient's temperature is high the diet must be liquid: milk, junket, custard, glucose lemonade, and fruit are all suitable; but meat, soups, and meat extracts are best avoided. The milk may be citrated or given with soda-water.

Violent involuntary movements may make nasal feeding with a tube necessary, while in less severe cases a short rubber tube on the spout of a feeding cup will suffice. For a child of 10 years the quantity of milk should be not less than two pints in the twenty-four hours. In afebrile cases, in addition to the above, eggs, fish, chicken, vegetables, and so on may be allowed, but butcher's meat is best avoided. It is probable that for a time the child will require hand feeding.

Drug Therapy

As chorea is rheumatic in origin salicylates or aspirin should be prescribed. Aspirin appears to be more helpful than sodium salicylate. Ten grains of aspirin may be taken three times daily by a child from 8 to 14 years of age, with suitable alterations for those younger or older. A calcium compound of aspirin, which is easily soluble, has recently been put on the market, and is to be preferred as less likely to cause indigestion—dose: 10 to 15 grains freshly dissolved in water and given three times daily.

Sedatives may be necessary to ensure sleep and quiet the movements. Bromide and chloral, 10 grains of each, may be taken one, two, or three times daily, according to the patient's condition. In very severe cases 1/100 grain hyoscine may be injected subcutaneously and repeated as may be necessary, or the following mixture may be helpful:

℞	Hyoscin. hydrobrom.	...	gr. 1/150–1/100
	Acid hydrobrom. dil.	...	♏ xv
	Aq. chlorof.	... ...	ad ʒ ss

Urethane is another drug which is useful where there is great restlessness, in doses of 5 to 10 grains, repeated as may be necessary. Among other drugs which have proved helpful are arsenic and nirvanol. The former may be given as Fowler's solution in doses of 3 to 10 minims three times a day, a careful watch being kept for any symptoms of intolerance. If the child is febrile or has

any evidence of rheumatic infection of the heart or pericardium, arsenic should not be prescribed until the active infection has been checked by salicylates or aspirin. But in non-febrile cases with no evidence of cardiac infection arsenic may be used from the beginning of treatment. Nirvanol is a drug which has had a considerable trial, and in some cases has seemed to produce good results, but its use is not unattended with risk of toxic symptoms. It is prescribed in daily doses of 0.3 gram (total) until a rash appears with some pyrexia, this is accompanied by an eosinophilia. In no case should administration be continued for more than fourteen days. Conjunctivitis or oedema of the eyelids is an indication for immediate cessation.

Protein shock has been recommended in America as likely to curtail the duration of the disease. I have tried it in several cases in older children who are afebrile and without cardiac complications. It has certainly appeared beneficial, and is induced by intravenous injections of T.A.B. vaccine in a dose of ten millions, repeated with increasing dose (20, then 30 or 40 millions) every fifth day. These doses are smaller than those stated to yield good results in shortening the duration of the disease, but in my opinion they provoke sufficiently satisfactory febrile reactions. It is very important to ensure sleep, and the drugs already mentioned as sedatives will be found useful for this purpose. Bromide and chloral in the doses mentioned will as a rule serve the purpose, but if sleep is not obtained by this combination medinal, 3 to 5 grains, according to the patient's age, may be administered.

(Chorea gravidarum is treated in a similar manner to that described. The condition of the patient is rarely so severe as to necessitate termination of the pregnancy, but there are cases in which the physical and mental condition of the patient may make this procedure necessary.)

Importance of Convalescence

Convalescence must be prolonged; its length will be determined partly by the condition of the heart and partly by the exhaustion produced by the disease. Even if there is no evidence of endocarditis the heart is frequently dilated, and the child should be kept in bed until the apex beat has returned to its normal position. A liberal diet should be given, and the patient should, if possible, be sent for at least a month to some quiet place on the South or West Coast. The air on the East Coast is too "exciting" for a child recovering from chorea. During this period an iron tonic may usefully be administered, such as syrup. ferri phosphatis, 1 drachm, thrice daily after food; or ferri carb. sacc., 10 grains thrice daily; or a mixture such as:

℞ Ferri et ammon. cit. ... ... gr. x
Liq. arsenicalis ... ... ♏ iij
Aq. chlorof. ... ...ad ʒ ss
ʒ ss t.d.s., p.c.

If the child is of school age the question of the date of returning to school must be considered. The child should not return to school for a period of three months from the onset of convalescence, and must be allowed to go easy at first. There is always the possibility of a relapse to be considered, and this must be borne in mind when deciding the amount of school work which should be undertaken and also the proper management of the child during its life at home. But in no circumstances should the child be overloaded with school work. Harmful as this is at any time, it is particularly to be avoided in the case of a child who has recently had chorea. Finally, it is important to inspect the tonsils very carefully, and if there is evidence of definite infection they should be removed.

THE WORLD TOUR AND THE FUTURE

The following article, written on board s.s. "Rajputana" approaching Marseilles, has been received from Dr. S. Watson Smith.

I

In the course of the century of its existence, no single year can have been so important to the welfare of the British Medical Association as 1935, the year of the first World Tour.

In the past, there have been occasions when, dictated by a change of policy, the Association has appeared to reach a turning-point in its career; and we can look upon this tour as marking yet another, perhaps the most important, for the reasons that: (1) This year of the Melbourne Meeting marked the first occasion upon which the Association has travelled round the world to meet in succession representative members and friends in almost every part of the great British Empire, effecting a personal contact with those whose interests are also ours, and learning on the spot of questions and difficulties that beset them; (2) The tour has achieved the cementing of friendships and assisted in binding us all together in what is surely one of the greatest of all causes, so affording greater strength and power to the Association; (3) It has brought to light certain new facts as well as grievances that for some time have been fomenting in several overseas Branches, which it should now be possible to redress and, we hope, remedy, a better understanding being thereby produced as between these Branches of the Association and they with the parent body.

II

We recognize that we have reached our present position but slowly and with many changes: that the history of the Association is a study in compromise, and a study of the influences between which compromise has had to be made. Continuity of policy and administration have, in the very nature of things, been interrupted and discontinuous. But if we have some knowledge as to our position at home, how are we situated as to the position of our Association in the various parts of the Empire? Not only do we find that the British Medical Association stands in a position almost unassailable everywhere, having a greater influence and power now than might have been supposed; and more than ever have we found it recognized that the B.M.A. is for the public good and necessary to the wise and effective administration of all health services abroad as well as at home.

Wherever the tour has taken us, we have been received with an overwhelming enthusiasm and hospitality and have made new friendships which we trust will be lasting. The great extent of our influence as an association and as the mouthpiece of the profession can now be the better gauged and appreciated. So can our position in relation to the community and the State.

It is our considered opinion that at the present moment our representatives abroad have greater difficulties to face in finding and holding members and in maintaining the prestige of the Association than ever before. It seems clear that we can no longer talk of unity of organization or of consolidating the position we hold. Rather does it seem that, to be progressive, we must give greater attention to local conditions and needs and to organizing, granting at the same time a greater measure of autonomy and conceding what is reasonable to the various Branches and Divisions abroad.

We must take the large view, not interpreting our duty in any narrow sense; and in so doing it seems to me we should be assisting in one way and another in the uphill struggle taking place in certain areas. But we must not confuse the "virtue of breadth with the vice of uncer-

tainty." As trustees of the future of the Association, it remains for us to act. Throughout the British Commonwealth there was evident to us an abiding loyalty to the Association good to see ; but such can be fostered and maintained only by constant vigilance and a fair and equitable representation.

III

We were never stronger than we are to-day: but it would be unwise to rest upon our oars. We should do a wiser thing to yield something more, to be ready at all times to disarm criticism from whatever source arising, and to be ready to meet all eventualities the future may hold for us. Such, it appears to me, can best be achieved by a broader and more generous policy of decentralization designed to direct our Association in the various ways open to us.

It was never more necessary than it is now that we should move towards the granting of a greater self-government. Grievances there are and grievances cannot be allowed to smoulder: they should be dealt with promptly and on the spot, better representation being afforded if practicable when that is appealed for, never allowing ourselves to become passive to the demands of any situation wherever arising.

We must put our house in order ; and this we should do without delay in every way possible, not the least being in the judicious exercise of the art of diplomacy, an art much to be desired and encouraged. Above all things, we should do everything that in us lies to promote a friendly and mutual support and lively co-operation in our work for the Association and for the medical profession, offering to our colleagues over-seas the helpful and peaceful enjoyment of membership with all that such implies.

What good will come out of this World Tour? It seems clear that substantial good must evolve in the direction of reviving active interest amongst our colleagues in the benefits and advantages offered by membership, and in emphasizing the Empire-wide character and beneficent influence of the Association, which constantly has at heart primarily the interests of the public not forgetting that of the individual member. It must not be forgotten that many of these, now as in the past, are doing much in the exercise of their calling to develop successfully each country belonging to the great British Commonwealth. This is a fact of Imperial importance not to be lost sight of.

Let us hope that the tour will have spun a web which will knit us all together, and secure a better understanding of each other's aspirations and difficulties, so promoting that unity of purpose essential to the existence of the Association as it is to those whose work lies amongst sick and suffering humanity. In this way will the future of the Association be safeguarded. And we must encourage that feeling of kinship and that patriotic enthusiasm which should subsist between tried and useful members of the greatest Empire the world has ever known.

S. WATSON SMITH, M.D., F.R.C.P.Ed.,
M.R.C.P.Lond.,
Immediate Past President.

At its meeting on October 30th the council of the Royal Agricultural Society in London adopted a resolution expressing the opinion that a sufficient case had been made out for pursuing further inquiries concerning the value of the Spahlinger vaccine against tuberculosis. In the council's view no time should be wasted and no money spared in making any further tests that might be thought necessary by the Government's advisers.

ST. BARTHOLOMEW'S NEW MEDICAL COLLEGE

THE PRECINCTS OF THE CHARTERHOUSE

When the Prince of Wales, himself a Perpetual Student of the College, dined with the old students of St. Bartholomew's on November 5th in the College Hall, Charterhouse Square, the occasion was taken as marking the opening of the new buildings on the Merchant Taylors' School site, although one of the departments—anatomy—is not yet completed. The seal was thus set upon an undertaking in which enterprise and good fortune have been happily combined.

Mr. W. GIRLING BALL, the dean of the Medical College, and the leading spirit in a development which must have given him, as an old Merchant Taylors boy as well as an old St. Bartholomew's student, peculiar satisfaction, furnished to a representative of this *Journal* some particulars of what has been done. The pre-clinical departments —chemistry, physics, anatomy, physiology, and pharmacology—have been removed from the hospital to the site, a quarter of a mile away, vacated two years ago by the Merchant Taylors' School. The reason for this departure was that the hospital wanted the area on which the College has stood, and the Merchant Taylors site was available, with no other site in prospect on the valuable city space close to the hospital. The site with the school buildings was purchased for £130,000, and new laboratories have been built and alterations made to the various departments, costing £70,000. Roughly the new laboratories in connexion with the physiology department have absorbed £14,000, alterations to the main school building for the purpose of that department £20,000, alterations to the chemistry department £4,000, alterations to the physics department £6,000, and to the anatomy department £26,000.

Towards the total sum £170,000 has been received. Bart's men have responded with great generosity to the dean's appeal, subscribing £35,000 out of the amount collected, and the present staff has guaranteed a further £20,000 by way of loan. The College has also been fortunate in the chairman of its appeal committee, Mr. J. H. Millar, who has contributed £20,000.

Arrangement of Departments

In the arrangement of the College in its new surroundings every department is allotted its own separate building, with lecture theatres (there are four of these, the largest holding 200), extensive laboratories, private rooms for professors and teachers, and provision for research work by individuals and groups. Common rooms, library, offices, and kitchens have been provided, and the proudest feature is the College Hall, with its hammer-beam roof, elaborate chimney-piece, stained glass, music gallery, and high table, which will serve as a refectory. It is a legacy from the Merchant Taylors' occupancy, and suggests civic pride as well as college rule. The students have access to tennis and fives courts, a gymnasium, practice cricket pitches, and other recreational facilities, and the view of the garden from the dean's office window makes it hard to realize that this is little more than a stone's throw from Smithfield Market.

The departments are arranged around the school square, with its grass and plane trees, overlooked by the mellowed stones of the Charterhouse. Alterations to the building have been carried out with great skill, so that the visitor is scarcely aware where the new begins and the old ends.

On one side of the square it is hoped eventually to build residential quarters for students, and then the university idea will be completely realized. The laboratories vacated by the Merchant Taylors' School have proved very adaptable to their new use, and with certain additions 120 students are amply accommodated in the department of chemistry and in that of physics. The main school building has been adapted for the use of the physiology department, and new laboratories have been constructed ; a long one-story structure has been assigned to biochemistry. The building of the anatomy unit is now proceeding by the conversion of the headmaster's house and the erection of a new building by the side of it. It would be tedious to describe all the up-to-date facilities which have been installed. Advantage has been taken as far as possible of every new resource in teaching and research equipment.

In conclusion, Mr. Girling Ball mentioned four features of the College on its new site. One of these was the excellent accommodation for professors and teachers in the way of private rooms and laboratories. Another, the adequacy of the students' facilities. The third, the accommodation—and the encouragement—afforded to accredited workers who desire to come and undertake some special research. The fourth, the maintenance of a university tradition and atmosphere, which should not be difficult on this tranquil "island site."

The History of the Site

The historical background in this move of St. Bartholomew's Hospital Medical College to the Charterhouse site is more than usually interesting. The site, although separated by a fair distance, as city distances go, from the hospital, once belonged to St. Bartholomew's, and is mentioned in Domesday Book, where its value is given as five shillings. In the fourteenth century Sir Walter de Manny, a "brave knight," whose deeds are blazoned in the pages of Froissart, purchased it for a plague pit, and subsequently built here a Carthusian monastery, which remained until the dissolution by Henry VIII, when the priory was used as a depot for the King's tents and pavilions. Presently it became the home of Thomas Howard, Duke of Norfolk, who entertained Elizabeth here, she rewarding him for his hospitality eventually by sending him to the scaffold. The next chapter in this strange eventful history was the purchase of the property by good Thomas Sutton, who endowed it as a charity by the name of the "Hospital of King James," Francis Bacon remarking that to design the Charterhouse, a building fit for a prince's habitation, for the purpose of a hospital was like giving a rich embroidered cloak to a beggar by way of alms. Under Sutton's bequest the Charterhouse comprised a hospital for gentlemen pensioners and a school for boys, and so remained, one of the outstanding examples of English charity. In 1872 the Charterhouse school, though not the hospital, was removed to Godalming in Surrey, and the ground occupied by the school buildings, the old green or cloister court, and the "wilderness of Howard House" was sold to the Merchant Taylors Company, which built its own school there in 1875, and for nearly sixty years occupied that property. The school left the city in 1933 for a site in Middlesex, and the opportunity came to St. Bartholomew's Medical College to purchase the site, adapt the existing buildings to its purpose as far as possible, and erect new ones. It is in a spot so eloquent of the past, where the old stones have been worn by the feet of monk and noble, of scholar and divine, that the students of Bart's in future will prepare themselves for their profession.

ANNUAL DINNER

The Prince of Wales's Speech

The annual old students' dinner in the new College Hall on November 5th was attended by the Prince of Wales in his twofold capacity as President of St. Bartholomew's Hospital and as an honorary Perpetual Student of the Medical College. Mr. W. GIRLING BALL took the chair, and the company numbered more than 400, including the Lord Mayor and Sheriffs, the Earl of Athlone (Chancellor of the University of London), the Presidents of the Royal College of Physicians and the Royal College of Surgeons, the Regius Professors from Oxford and Cambridge, and many other leading representatives of academic and civic life.

The PRINCE OF WALES, in proposing "Prosperity to the Medical College of St. Bartholomew's Hospital," recalled the cordial welcome given him when he visited the Charterhouse site two years ago, just after it had been bought. Bart's men might well be proud of having collected most of the money needed and on having almost completed the new buildings in so short a space of time. "We take off our hats to them for having got on with the job so quickly. It has been a fine effort, and I am glad to know that your determination and vision have assured for future generations ample opportunities for study and research in this great medical school, which caters for students from all over the world." After an amusing reference to the implications of the phrase "perpetual student," His Royal Highness said that he had lived long enough to realize from his own knowledge the great debt of gratitude the community owed to the medical profession, and especially to research as carried on in the medical schools, and concluded:

With your recent move you have, I know, made more adequate provision for research work, both in the basic sciences and in the diagnosis and treatment of patients. You have rebuilt all your laboratories for pre-clinical scientific teaching, and I am specially glad to know that you have given facilities for exercise as well as study—tennis, rackets, and fives court, as well as a gymnasium now being provided to help the town-dwelling student to maintain his health. This is a very important factor. It has been a great departure, this move—the biggest step forward the College has made since its foundation over a century ago. I am glad to see so many old Bart's men and friends of the College present to-night, and as this College is a constituent part of the University of London I am glad, as a "perpetual student," to welcome the Chancellor of the University in the shape of my uncle, the Earl of Athlone. Here on this historic site you have introduced, with great success, the collegiate atmosphere. I hope that the University authorities who are present will be pleased with their offspring, and that the City, represented by the Lord Mayor, will recognize that, though the school is not actually in the City, it has near its heart one of the finest training institutions for medical students in the world.

Acknowledgements and Congratulations

The CHAIRMAN, replying to the toast, said that the Medical School had lived happily for a hundred years within the walls of the great hospital to which it belonged ; but that home had become too small and there was no room for expansion on the Smithfield site. By a great effort they had acquired the magnificent premises in Charterhouse Square, and their pride in this was enhanced by the presence that evening of the Prince of Wales, who had encouraged them much when he visited the "derelict area" two years ago. The Lord Mayor and Sheriffs by their attendance showed once again the continued interest of the Corporation of the City of London in St. Bartholomew's, while the authorities of the University of London were present in full force to prove their appreciation of Bart's as a constituent

college. After touching upon the history of the site, which had in mediaeval times belonged to St. Bartholomew's Hospital and throughout most of the centuries had been devoted to education, Mr. Girling Ball paid a tribute to Sir Holburt Waring for his encouragement in securing Merchant Taylors' School for Bart's; to the Merchant Taylors Company for their indulgence and patience; to the staff and old Bart's men everywhere for their generosity; to Sir Charles Collett for the City appeal; and to various munificent donors.

Lord STANMORE, Treasurer of the Hospital, proposing the health of the Lord Mayor, Sheriffs, and Corporation, complimented Sir Stephen Killik, "the first Citizen of the greatest city in the world," on a memorable year of office. The acquisition of the Charterhouse site, he said, emphasized the educational side of the work of Bart's and would stand for ever as a milestone in the history of the hospital and its college. The LORD MAYOR, in reply, said it was a special privilege on one of the last occasions when he would respond to the civic toast to acknowledge the love and regard of the City for Bart's, which it always looked upon as its own hospital. His Royal Highness's visit was a compliment not only to Bart's, but also to the City of London, with which the hospital had been so closely linked throughout the centuries.

"The Health of the Guests" was proposed in comprehensive terms by Mr. REGINALD VICK, Warden of the College. After extending a general welcome to "a world of famous men," he greeted in particular the Treasurer and Almoners of St. Bartholomew's Hospital, the Masters of various City Companies, the Chairman of Lloyds, the Master of the Charterhouse, and the head master of Merchant Taylors'; Dr. Arthur MacNalty, representing the Minister of Health; the Vice-Chairman and the Chief Medical Officer of the L.C.C.; the medical heads of the three Services; the Chancellor, Vice-Chancellor, Principal, and Chairman of the Court of the University of London; Sir Farquhar Buzzard and Professor John Ryle, from Oxford and Cambridge; Lord Dawson of Penn, P.R.C.P., and Sir Cuthbert Wallace, P.R.C.S.; Dr. Christopher Addison, one-time professor of anatomy at Bart's; Lord Hirst and Lord Plender, members of the appeal committee; the deans of two sister hospitals, Guy's and St. Thomas's; the representatives of the Press, which had never failed in its friendliness to Bart's; and lastly the students, upon whom hung the whole future of the College. Bart's, Mr. Vick said in conclusion, was proud of its antiquity, and perhaps still more proud of its youth and energy to-day. Lord MACMILLAN, in reply, joined in the general felicitations. Dining with doctors, he said, was always a pleasure. Medicine, perhaps naturally, attracted the good will of the world: had it not a monopoly of the epithet "beloved"? On behalf of the University of London he offered congratulations on the great success of the present venture, expressing his own admiration for the work of Bart's in research and for its co-operation with other schools. Lord HORDER, the senior physician, proposing "The Health of the Chairman," said that the achievement they were celebrating that night was largely the result of Mr Girling Ball's personal drive, his foresight, and his indomitable pluck. Their chairman's "anxiety neurosis" about the new College had been appeasable only by the administration of large cheques; but thanks to princely donations this malady was now well under control. What Mr. Ball had accomplished had been done without neglect of teaching and practice, and throughout it all he had preserved a view of medical education as it should be.

The formal proceedings ended with the CHAIRMAN'S reply and three cheers for the Prince of Wales, after which the guests had an opportunity of inspecting the various departments of the new Medical College.

We have received a copy of a new Spanish journal entitled *Revista Española de las Enfermedades del Aparato Digestivo y de la Nutrition*, which is published monthly at Madrid as the organ of the Spanish Society of Diseases of the Digestive System and Nutrition.

MEDICAL CANDIDATES AT THE GENERAL ELECTION

The following is a further list of members of the medical profession who have been nominated as candidates for election to the House of Commons at the General Election on November 14th, supplementing the list published last week at page 849.

ENGLAND

LONDON BOROUGHS

Dr. C. R. Cooke-Taylor (L.), Dulwich.
Dr. Elizabeth Jacobs (Lab.), St. Marylebone.
Dr. S. W. Jeger (Lab.), St. Pancras (South-East).
Dr. G. de Swietochowski (L.), Paddington (North).

ENGLISH BOROUGHS

Dr. D. McIntosh Johnson (L.), Bury.
Dr. P. McDougall (Ind.), Manchester, Rusholme.

SCOTLAND

SCOTTISH BURGHS

Dr. R. A. Barlow (L.), Edinburgh Central.

SCOTTISH COUNTIES

Dr. W. S. R. Thomas (L.), Aberdeen and Kincardine Central.

Dr. J. H. Williams has been returned unopposed for Carmarthen, Llanelly, and Professor T. Sinclair for the Queen's University of Belfast.

Nova et Vetera

THE ILLNESS OF THE EMPEROR FREDERICK

The echoes of the controversy over the illness of the Crown Prince of Germany, afterwards the Emperor Frederick, have now died away, and therefore Mr. Lionel Colledge could take this subject as the theme of his brief presidential address to the Section of Laryngology of the Royal Society of Medicine last week without any misgiving.

Mr. Colledge made it clear that he was neither criticizing nor defending those who had charge of the royal patient; his purpose was to study the illness from the pathological standpoint in the light of modern knowledge. Sir Morell Mackenzie arrived in Berlin on May 20th, 1887, without knowing exactly why he had been summoned. He found that the Crown Prince had been suffering from an affection of the larynx since the previous autumn, that a diagnosis of cancer had been made, and that the operation of thyrotomy was to be undertaken the following day by von Bergmann, but that it was desired first to get another opinion. Mackenzie saw with the mirror a growth about the size of a split pea on the posterior part of the left vocal cord, disappearing from view on phonation. He stated that this showed that it was partly attached to the under surface as well as to the side of the cord—in other words, was partly subglottic. His opinion was that the diagnosis of cancer had been made on insufficient evidence; he removed a portion of the tumour and sent it to Virchow, who reported the growth to be benign. Mackenzie advised the removal of the growth with forceps, but did not attempt it at the time, and left Berlin, not returning until June 7th, when he again removed a piece of the growth and sent it to Virchow, who reported that the lesion was pachydermia verrucosa, and that in no part could the ingrowth of this epithelial formation into the mucous membrane be detected. On the strength of Virchow's report it was decided to treat the case by endolaryngeal extirpation of the growth with forceps. On June 28th another piece, thought to be the entire growth, was removed and sent to Virchow, who again found no evidence of malignant

changes. In September it was observed that the left cord still did not move freely, and that the posterior extremity was on a higher level than that of the right cord. During October the swelling below the left cord increased in size and began to ulcerate, and by the end of the month another swelling appeared below the right cord. Early in November, while the Crown Prince was at San Remo, these subglottic tumours began to increase rapidly, and Schrotter was summoned from Vienna and diagnosed cancer, with a recommendation that the entire larynx be excised or as an alternative that a palliative tracheotomy be performed. The patient declined excision of the larynx, but agreed to tracheotomy if shown necessary as a last resource. The increasing dyspnoea had to be relieved at length by tracheotomy, which was performed by Bramann on February 9th, 1888. A month later any doubt was dispelled when particles of cancerous tissue were found in the sputum. The disease progressed steadily, and ended fatally in June. Necropsy revealed destruction of the larynx by growth and perichondritis.

A Subglottic Growth

Why, asked Mr. Colledge, did Mackenzie fail to recognize the nature of the disease, and why did he fail to obtain specimens of tissue from which a correct diagnosis could have been made by Virchow? The answer to both questions was that the cancer was subglottic. The majority of intralaryngeal cancers originated on the middle or anterior portion of one or other vocal cord, but a much less common variety originated beneath the glottis. Isambert had described it in 1876, and suggested that such cases should be classified in a separate group. Butlin, in his book published in 1883, showed that he was familiar with this group, but Mackenzie apparently was not, for in his *Manual of Diseases of the Throat and Nose* (1880) he did not mention this variety of laryngeal cancer beyond saying that in two cases out of fifty-three the left cord and subglottic region were affected. The condition did not, in fact, attract much attention until redescribed in recent years by Sir StClair Thomson, who drew attention to its grave prognosis.

After showing illustrations from Mackenzie's book *The Fatal Illness of Frederick the Noble*, Mr. Colledge said that it was evident that while attention had been fixed mainly on the cords themselves and the region above, the tumour was spreading widely and rapidly below the cords. By November, 1887, the growth was visible in the subglottic region on both sides, and the story from that time onwards was merely one of perichondritis secondary to malignant disease. He concluded from the descriptions given by various observers that the growth was really of the subglottic variety, with a small extension upwards in the region of the vocal process, and not the ordinary cordal growth. If von Bergmann, whose diagnosis was correct from the first, had performed the operation which he proposed in May, 1887, he would have found the growth far more extensive than he expected. Partial resection of the larynx at that time might have saved the patient, or the condition disclosed might have called for total extirpation of the larynx. In spite of the subsequent delay and the onset of perichondritis, the patient might still have been saved in the following February had total laryngectomy been performed as advised by Schrotter, but the operative risk would naturally have been greater. The attempt by Mackenzie to remove pieces with forceps by the indirect method when the tumour was subglottic merely resulted in misleading pathological reports.

England and Wales

Vital Statistics for 1934

"Part I: Tables, Medical," of the *Registrar-General's Statistical Review* for 1934 is now on sale at H.M. Stationery Office (6s.). The principal features of this report are summarized below: The number of live births registered in the year was 597,642, giving a birth rate of 14.8 per 1,000 persons living. This rate was 0.4 above that for 1933—the lowest ever recorded. The death rate was 11.8 per 1,000 persons living, 0.5 below the rate for 1933. When allowance is made for the fact that the average age of the living population is increasing every year, the resulting corrected or standardized death rate was the lowest ever recorded both for men and for women, the rate for the sexes together being just half of the corresponding rate in 1881–90. The survival rate of infants was also greater than in any previous year, only fifty-nine dying before their first birthday to each 1,000 born alive, compared with sixty-four in 1933, sixty-five in 1932, and 128 in the first decade of the century. Mortality from infectious and parasitic diseases in general reached a low record of 1.3 per 1,000, notwithstanding increases for scarlet fever and diphtheria, and the tuberculosis rate declined once again to a new low record of 763 per million. Pneumonia gave the lowest rate save in 1930, which was also a very healthy year. The cancer rate, corrected for the increasing age of the population, rose slightly to 1,003 per million, but was still below the levels reached in 1928 and 1929. Deaths of women attributed to complications of child-bearing numbered 1.95 from septic causes and 2.46 from "other accidents" to each 1,000 live and stillbirths, compared with rates of 1.75 and 2.57 respectively in 1933. The lack of improvement in this rate was offset, however, by reduction in other risks of death, so that the death rates of women from all causes combined were the lowest ever recorded at every period of life from aged 20 onwards. The total rate of dying for women aged 25 to 35, for example, was only three in each 1,000 living, compared with five in 1901–5 and eight in 1876–80.

The Vaccination Question To-day

Dr. C. Killick Millard chose this as his subject for a Chadwick Lecture at the Royal Society of Tropical Medicine and Hygiene on November 1st, with Professor M. Greenwood in the chair. The vaccination question, he said, was one of the most remarkable controversies of the age. Originating when vaccination was first introduced, it became acute over sixty years ago with the attempt to enforce compulsion. It had been characterized by much bitterness, largely accounted for by the enforcement, under penalty of the law, of a surgical operation, by no means entirely free from risk, which many parents disbelieved in and regarded as an interference with personal liberty. In the past one either had to believe in vaccination or to disbelieve in it. There was no "half-way" house. Either one regarded vaccination as a "boon and a blessing" which all should welcome, or as an "exploded delusion" to be avoided as something evil. The pro-vaccinists, headed by the medical profession, used to treat the anti-vaccinists with impatience and contempt as being ignorant, misguided, and dangerous fanatics; while the anti-vaccinists regarded the pro-vaccinists as being gulled and hoodwinked by a crafty medical hierarchy, who were out to bolster up a "grotesque superstition" for the sake of the money to be made out of it. Dr. Millard said that his great object all through his professional life had been to find out where the truth really lay, and if possible to bring the two sides together. To some extent he believed he had been successful in achieving this. He would like the epitaph on his tombstone to be "He bridged the gulf between the 'vacs' and 'anti-vacs.'" For himself his faith in vaccination as a means for protecting the individual against small-pox was just as strong and unassailable as ever it was, but he recognized that, as a State institution for protecting the community, infant vaccination had been largely a failure. The case of this country in 1871–2 and of India to-day were outstanding illustrations of this. Lack of sanitation, not of vaccination, was the true cause of the appalling small-pox mortality which still persisted in India. He believed that the medical profession, from Jenner onward, had claimed too much for vaccination, and that vaccination had been credited with having reduced small-pox

mortality in this country much more than was really the case. To-day this was being recognized by the medical profession, or at least by medical officers of health, and it could hardly be otherwise, for in spite of continuous and increasing neglect of infant vaccination small-pox mortality had practically disappeared. Again, until a few years ago it was taught as a cardinal medical dogma that the neglect of infant vaccination entailed serious and imminent risk of small-pox mortality returning. It was doubtful if many sincerely believed that to-day. Certainly the experience of the city of Leicester, which openly abandoned infant vaccination fifty years ago, and yet where during the last thirty years there had been only two deaths from small-pox, made such a belief rather difficult. Since the war an ultra-mild form of small-pox has appeared in this country, and considerable spread had taken place. Its very mildness has made it more difficult to control. It had now been officially recognized as a distinct variety, which bred true, and it had been accorded a separate name—"variola minor"—to distinguish it from the severe form—"variola major." In fact, though not officially recognized as such, variola minor existed in this country long before the war, and in certain countries under the name of "alastrim" it had existed from time immemorial. Variola minor presented quite a different administrative problem from variola major. Compared with the latter it was non-fatal, non-disfiguring, non-loathsome. In some ways it was no more serious than vaccination, so that no case could be made out for retaining compulsory vaccination merely on account of variola minor. Reviewing impartially the vaccination question to-day, Dr. Millard was driven to the conclusion that the repeal of the Vaccination Acts was now overdue.

Cleaner Swimming Pools

The Minister of Health has drawn the attention of local authorities to the necessity for cleanliness in swimming pools, in an official circular (No. 1503, H.M. Stationery Office, price 1d.). The circular emphasizes the opportunity which the winter months offer for ensuring a proper standard of cleanliness and purity of water in swimming baths and pools. The Ministry always insists on the provision of any plant needed for this purpose as a condition of sanctioning any loan for baths or pools; but the plant once installed ought then to be properly maintained and used. Besides baths and pools in public ownership, whether provided by loan sanctioned by the Ministry or not, there are nowadays a large number of pools provided by private owners—for example, at road-houses. The circular therefore urges not only local authorities but private owners of baths or pools as well to inspect their present arrangements thoroughly, and indicates the statutory powers of control which local authorities can exercise, if need be, over privately owned pools used by the public. For authoritive information about the best means of maintaining adequate purity the circular refers to the report *The Purification of the Water of Swimming Baths*, prepared by the Ministry and published in 1929 by the Stationery Office (1s.).

Pioneer Health Centre at Peckham

A Pioneer Health Centre has been established in St. Mary's Road, Peckham, for which the claim is made that it is the first of its kind in the world. It is housed in a new building almost entirely constructed of glass in open grounds. It provides a charming nursery or crèche, a very large swimming bath, a well-equipped gymnasium, a solarium, boxing and dance halls, lecture rooms, and garden playgrounds, as well as a cafeteria lounge. The unit of membership of this club is the family as a whole, and already, after three months' working, 350 families have joined. It is expected that the full cadre of from 1,500 to 2,000 families will be reached in eighteen months or two years. The idea is to bring together members of all classes in the local community to enjoy their leisure in common and learn from one another. The first "Peckham experiment" was begun ten years ago, when a number of medically trained biologists started a family health club by inviting families to join at sixpence a week. In return fathers and mothers had an annual medical overhaul, adolescents a half-yearly examination, children of school age an examination every three months, and infants an examination every week. From this simple beginning a social organization sprang up in which recreation and cultural development and everything on the positive health side was encouraged, but the family throughout was insisted upon as the biological unit. A careful watch was kept for undisclosed disease or the effects of unhealthy environment. No treatment was given, but those needing treatment were referred to the appropriate individual or centre. This first experiment has given place to the present more ambitious undertaking in an excellent home of its own. By a subscription of one shilling a week per family, plus certain other subscriptions, the centre is expected to meet its running expenses, and a capital deficit of £30,000 is on the way to being made good by an offer from Lord Nuffield, who was so pleased by what he saw on a visit to the building that he promised £25,000 conditional upon the raising of the other £5,000. The medical director of the centre is Dr. Innes Pearse.

Professor Sauerbruch at Newcastle

On Thursday, November 14th, at 5 p.m., at the University of Durham College of Medicine, Professor Sauerbruch of Berlin will give the annual address to the University of Durham Medical Society. His subject will be "The Position of Modern Surgery in the Light of History." At 7.30 p.m. he will be the guest of the society at its annual dinner in the County Hotel. The following day, at 4.15 p.m., in the Royal Victoria Infirmary, Professor Sauerbruch will address the Newcastle and Northern Counties Medical Society on "The Development of Thoracic Surgery."

Scotland

Voluntary Hospitals in Scotland

The Departmental Committee on Scottish Health Services, the president of which is Professor Cathcart, received evidence on November 1st on behalf of the voluntary hospitals. It was submitted that the future of the voluntary hospitals depended largely on the attitude to them during the next five years of the State and of local authorities. Voluntary hospitals approved of the provisions of Section 27 of the Local Government Act, 1929, which conferred powers on local authorities to provide general hospitals, but they did not consider that the working of this section had been satisfactory, since local authorities had not proceeded sufficiently on the principle of co-operation. It was also suggested that the voluntary hospitals should be recognized by the State as an essential factor in the national health services, and that this might be done by a representative organization set up to bring these hospitals directly into touch with the Department of Health for Scotland. A further point which was urged was that the present inadequate domiciliary medical attention added greatly to the out-patient work of the hospitals, especially in regard to children.

Chair of Surgery at St. Andrews

At a meeting of the University Court of St. Andrews University it was resolved to invite Mr. R. C. Alexander, F.R.C.S.Ed., to the chair of surgery in the University in succession to the late Professor John Anderson. Professor Alexander was born at Edinburgh in 1884, and educated at George Watson's College, at Edinburgh University, and in Paris. He graduated M.A. at Edinburgh in 1904, and M.B., Ch.B. with honours in 1908. After periods as resident surgeon with the late Professor Alexis Thomson in the Royal Infirmary of Edinburgh, and as resident surgical officer with Sir Harold Stiles at Chalmers

Hospital, Edinburgh, he became assistant to Professor Thomson in the department of surgery at Edinburgh and clinical surgical tutor with Mr. J. W. Dowden in the Royal Infirmary. He was later assistant surgeon to the Chalmers Hospital. In 1921 he went to Dundee, where he was appointed visiting surgeon to the Dundee Royal Infirmary on the death of Mr. W. L. Robertson ; at the same time he became lecturer in clinical surgery in the University of St. Andrews. At the same meeting of the University Court intimation was made that Imperial Chemical Industries Ltd. had made a gift of £100 to the chemistry laboratory at St. Andrews, and an equal sum to the chemistry laboratory at Dundee, in aid of research in chemistry.

Health of Berwickshire

The annual report of Dr. Andrew A. McWhan, medical officer of health for Berwickshire, refers particularly to the use of vitamins in treatment. He points out that milk and eggs form an expensive diet for a family on a small wage, but that any deficiency of these foods could be readily compensated by a greater use of cheese, which is cheap, and of salads and vegetables, which are not used enough, and by the substitution of wholemeal for white bread. He suggests that in dressing children more of their bodies should be exposed to the sunlight in summer, especially in the case of boys, who might wear sleeveless shirts, shorts, and no stockings. The report also refers to the fact that children from the county of Berwick who suffer from deformities now receive treatment in Edinburgh, and after discharge from hospital are kept under supervision by health visitors, so that any tendency to relapse may at once be rectified by readmission to hospital. The county hospital is also linked up for suitable cases in this orthopaedic service, which has proved an unqualified blessing to crippled children. Referring to the type used in school books, Dr. McWhan suggests that this should not be smaller than 12-point in books intended for teaching children to read ; for any purpose no smaller type than 10-point should be employed. Children's illustrated weekly papers are particular offenders, being generally printed in a type smaller than 8-point ; this matter should receive attention from teachers and parents.

Presentation to Dr. H. C. Marr

Dr. Hamilton C. Marr, who lately retired from the position of Senior Medical Commissioner on the General Board of Control, was entertained to dinner on November 1st by former colleagues and alienists in Scotland. The dinner was held in the hall of the Royal College of Physicians, Edinburgh, and Dr. Marr was presented with a cheque and a silver salver. Dr. R. B. Clarkson, who presided, said that Dr. Marr had held the highest office which the Crown could bestow on a psychiatrist in Scotland for a longer period than any of his predecessors. He had been a medical commissioner for twenty-five years, and during this time there had been many changes in lunacy work. He had always been eager to do everything he possibly could for patients and for medical superintendents of asylums, and his friends offered Dr. Marr their best wishes for his retirement. Dr. Marr, in expressing his thanks, described various incidents in his career as a psychiatrist. He mentioned a case which had particularly impressed him at the outset of his career—that of a woman who showed an advanced degree of myxoedema. At that time the functions of the thyroid gland were being studied by Professor Oliver of Newcastle, who had suggested that the administration of thyroid gland might be beneficial. It was possible to procure thyroid glands of sheep fresh every day for this patient, and these were minced and given raw on bread-and-butter daily. In three months the patient was a normal woman, and continued to do excellent work during the remaining twenty-two years of her life. From this case Dr. Marr had formed the opinion—and his later experience had never altered it—that when an individual became changed mentally there was invariably some physical change for the physician to discover and to remedy.

Reports of Societies

TREATMENT OF BREECH CASES

At the first meeting of the Section of Obstetrics of the Royal Society of Medicine for the session 1935, with the new president, Professor FLETCHER SHAW, in the chair, a discussion on "The Treatment of Breech Presentation, with Special Reference to Cases of Extended Legs and Arms" was opened by Dr. J. W. BURNS of Liverpool.

Dr. Burns stressed the need of adequate care in the ante-natal period, particularly with reference to eliminating causative factors of a breech presentation and prophylactic external version. He considered that this latter should be done not later than the thirty-sixth week, and did not regard it as entirely harmless, since there was a risk of separation of the placenta. During labour he recommended the employment of an abdominal belt which he demonstrated to the Section. Apart from the pressure exerted by the belt, no handling of the uterus was allowed until the actual delivery of the head. In his view the placenta ceased to function earlier than was generally appreciated, and it no longer gave oxygen to the foetus after the head began to pass through the brim. He then described his technique for delivering the after-coming head, whereby the accoucheur was restrained from undue haste and prevented from employing too much force. With the mother in the cross-bed position her legs were held in the lithotomy position by a Clover's crutch. As soon as the shoulders and arms were delivered, the trunk was allowed to hang vertically down, whereby the occiput was pulled down towards the subpubic angle and the head forced to become flexed. Subsequently the child was grasped by the legs, and enough traction employed to keep the body taut ; this kept the occiput well down into the subpubic arch, and delivery was completed by elevating the child's trunk towards the mother's abdomen, at the same time employing strong pressure upon the fundus uteri.

Mr. C. M. MARSHALL described the methods used in the Liverpool Maternity Hospital, with particular reference to a series of deliveries of primigravidae, in which the breech presented with legs extended. The important point was that when the buttocks were distending the vulva, delivery was taken over by the obstetrician, who, under a local anaesthetic, first performed episiotomy. A little later chloroform was administered, and the accoucheur applied traction to the groins until the knees were at the vulva, after which the legs could be delivered by pressing in the popliteal spaces. Further traction then brought the extended arms within reach, and in some cases, by dropping the trunk of the child posteriorly, the anterior arm could easily be delivered. If, however, traction failed to bring the arms well within reach, then the posterior arm was first brought down by the usual manœuvre. The head was delivered by the method described by Dr. Burns. The results in the series under consideration were very good. In only two out of forty-two cases did the legs have to be brought down. In the other forty the child was delivered with the legs still in the fully extended position. Out of forty-two children one was stillborn and one died shortly after birth.

Mr. D. W. ROY reported a statistical inquiry into the results of delivery of cases of breech presentation with extended legs at the York Road Hospital. The treatment employed differed from that described by Mr. Marshall in that, generally speaking, episiotomy was not done nor was traction applied to the groins ; instead, labour was allowed to proceed spontaneously, and in the majority of cases descent of the child occurred until the knees appeared at the vulva, after which the legs could easily be disengaged. This extended attitude of the legs was very common in primigravidae ; in fact, he regarded it as the probable condition in such patients when the breech presented in labour. When ante-natal supervision had been adequate the risk of trouble from extension of the legs was grossly exaggerated, and he deprecated the popular teaching that bringing down the legs was

necessary, except in a small minority of cases. He admitted that difficulty might be met with if the child was large or the pelvis small, but this threat of disproportion could be dealt with by inducing premature labour. He found that difficulty in delivering the head was a much less common cause of trouble than delivery of the arms, but it was likely to contribute danger to the child when time was lost in bringing down the arms or when the head had to be delivered rapidly. For delivery of the head he advocated raising the child's trunk and making suprapubic pressure. The results from his series of cases were excellent. There was no maternal mortality, and from seventy-seven primigravidae there were sixty-eight living children. The seventy-eight multiparae had seventy-one living children. Thus the foetal mortality for primigravidae was 10.3 per cent., and for multiparae 8.9 per cent., giving a total foetal mortality of 9.6 per cent.

Mr. EARDLEY HOLLAND emphasized that it was intracranial injury and not asphyxia which was the main cause of foetal death in breech cases. Mr. ALECK BOURNE contended that the fear of an impacted breech presentation made him hesitate to allow most cases of breech with extended legs to be delivered in the manner described by the openers. He thought that when there was any doubt at all it was wiser to bring down the legs and at the same time to place the child's arms in a position of flexion. Mr. W. H. F. OXLEY went further, and stated that in his very large experience of delivery of these cases he had found it wiser, and now made it the routine practice, to bring down the legs early in the second stage. Dr. SCHILLER of Vienna advised using pituitrin in cases of breech delivery before having recourse to manipulation. Miss MOORE gave the figures for breech delivery in 1934 at the Royal Free Hospital. They showed a gross foetal and neo-natal mortality rate of 16.6 per cent. Among further points discussed by other speakers were the dangers of external version if performed with any violence.

ELECTRICAL INJURIES

The first of the sessional discussions of the Medical Society of London, held on October 28th, with Professor GEORGE E. GASK in the chair, was on "Electrical Injuries."

Dr. MACDONALD CRITCHLEY, in opening, said that this was a neglected chapter in medicine and surgery. Yet in England and Wales each year there were between fifty and sixty fatalities from electrocution, not to speak of a very large number of major and minor injuries. On the Continent the incidence of accidents was much higher, and in Germany it was believed that about 400 people lost their lives from this cause every year, while in the United States the number given was between seven and eight hundred. Under the national grid system the consumption of electricity in this country was going up rapidly, and it was believed that by 1940 it would amount to something like twenty-five thousand million units. There was no reason, however, to predict any considerable increase in industrial accidents, though domestic accidents would probably multiply. With regard to technical factors, it was not strictly true that the higher the voltage the greater the danger. People had been killed by 45 volts, and fatalities from the 100–250 voltage light main were extremely common. On the other hand, there were many instances of people who had touched the overhead cables of the grid system and escaped serious injury. The second important factor was amperage. Currents of 20 to 30 milliamperes were unpleasant, those of 70 to 90 potentially dangerous, and currents of 500 almost universally fatal. Something depended upon type of current. Volt for volt, alternating currents were much more dangerous than direct. As for resistance of tissues, the skin, especially dry skin, was very resistant. Sweating reduced the resistance of the skin twelve times, and immersion in water twenty-five times. The best conductor of electricity was cerebro-spinal fluid, followed closely by blood, and then by the viscera, especially the liver. It had been computed that one inch of sciatic nerve had about eight times the resistance of one inch of Atlantic cable. Prolonged contact with current, as when lying unconscious on a live rail, might be fatal when brief contact was scarcely injurious. The longer the current passed the more the resistance dropped. He had collected notes of thirty-six cases of suicide by electric current. It was a mode of suicide favoured by young people. High tension was the method of choice, but some people committed suicide by contact with low pressure circuits, and one London engineer committed suicide from the lighting main: he put an alarm clock in the circuit, timed to release the current at 3 a.m., and retired for the night, the current killing him during sleep, confuting the idea that during sleep fatal electric shock was impossible.

The effects of electrical shock were immediate, secondary, or remote. The first immediate effect was pain, agonizing and generalized throughout the body. Many victims complained of deafness, loss of vision, sometimes hallucinations, such as balls of fire or flashes of light—what tramway men, who received many of these shocks, called "moons." Another complicated sensation was that of shrinkage of the body. All sense of time was lost. A contact of five seconds might seem like ten minutes to the sufferer. One man who had a shock in the street, with contact which could not have lasted longer than five seconds, declared that he was able to see each spoke of the wheel of a passing bicycle, and that he felt every reversal of the current (25 to 50 per second). The next immediate effect was unconsciousness, either syncope—fainting from the mere effect of the pain—or prolonged unconsciousness comparable with that found in concussion. Very often there was retrograde amnesia, which sometimes dominated the picture. Another type of unconsciousness in electrical injury came on after an interval perhaps of hours. More than one type of electrical burn had been described, and some authorities held that the term "burn" was not strictly accurate, the lesion being different histologically and clinically from the ordinary heat burn. The chief abnormal appearance with an electric burn was the unusual depth and the tendency to spread within the first few days after shock. Jellinek declared that electrical burns were painless and sterile, and they healed rapidly with a good scar, but that was not the speaker's experience. There were also electrical marks, where the current entered and left the body, and metallization of the skin, due to metallic particles from the conductor, was frequent. Electrical burns were often extensive, resulting in gigantic tissue necrosis, a whole limb being virtually amputated. A type of burning which figured in a good many medico-legal cases was sustained during permanent waving. Bone injuries were important and interesting. When a current passed through a limb it was not rare for a longitudinal fracture to occur without any displacement of fragments. Another type of bone injury was dislocation from direct muscular violence. Electrical oedema was a term often used to describe an injury or appearance following shock. The fall of hair was frequent, and it sometimes re-grew as white hair. Pupillary disturbances were common, and Argyll Robertson pupils had been described.

The remote complications of electric shock were not well recognized, and their true nature was frequently missed. They took two forms—namely, ocular and neurological. Ocular complications were optic atrophy and cataract. Neurological complications might include organic diseases of the central nervous system. Organic neurological conditions could apparently be precipitated either by electrical or by lightning trauma. The characteristic sequel was complications in the spinal cord. Psychological disorders might be started or modified or even cured by electrical shock. Not a few cases were on record in which electric shock had been followed by mental illness. As for cure, there was a well-known case of a boy with dementia praecox who fell off a pylon, after which his previous psychosis tended to clear up. Hysteria was extremely common after electric shock, and Dr. Critchley mentioned one or two cases in which a person had touched what was apparently a live rail or wire and

had sustained the symptoms of shock, though it was proved afterwards that no current was passing at the time.

As for the cause of death in electric shock, there were two theories: the cardiac theory, that death occurred from ventricular fibrillation, and the respiratory theory, that there was a medullary inhibition of respiration. The probability was that both were correct. Probably the cardiac type of death was commoner with low tension, and the respiratory with high tension. He touched on legal electrocution, and described the "electric chair" as used in the United States, and the extraordinary alternations of voltage which were used over a period of many seconds in the execution of Czolgosz, the assassin of President McKinley. Was this barbarous or humane? The evidence was that consciousness was immediately lost, but that death did not occur instantaneously. First-aid treatment for electrical shock was immediate and prolonged artificial respiration, but he questioned the often-quoted statement that artificial respiration must be continued for many hours. Finally he touched on individual idiosyncrasies. Certain factors made persons less susceptible. Pregnancy was one, and a pregnant woman could bear shock better than another. Sleep was said to protect, though this was in doubt. Attention inhibited the shock: if a man knew he was about to receive a shock he bore it better than if it came as a surprise.

Mr. ERIC PEARCE GOULD quoted an account of judicial execution from a book entitled *Sing Sing Doctor*, the author of which claimed to have given the signal which sent 132 men to electrical death. In the early days a current of 14,000 volts was used, and it required anything up to seven "jerks" before death. Now the practice was to use a current of 22,000 volts, which was kept on until there was singeing, on which the doctor in attendance examined the heart with the stethoscope, and if it had not ceased to beat he raised his hand and another "jerk" was given. It was not so much a question of pressure of current as of amperage, and this author calculated that it took one ampere to bring about death. The speaker's own small experience of electrical injuries was on the electrified Southern Railway, where the voltage on the conductor rail was only 650 (direct current). Out of a total of 2,274 accidents on the line in 1934 the total number of electrical injuries was thirty-eight, of which two only were fatal, both of them young children, who had strolled on to the permanent way. Excluding these, and excluding two elderly men who were badly burned and did not return to work, the average period of incapacity following injuries was seven weeks and two days. Among the men who returned to work there seemed to be a definite element of fear that the thing might happen again. His impression was that the burns were not as painful as they were in a similar accident due to other causes. He recalled two or three cases in which, despite the extent of the burning, the scarring was minimal.

Mr. ZACHARY COPE recalled the case of a man who had been struck by lightning in Regent's Park. His hat, boots, watch, and clothes were rent in shreds, and yet he himself sustained only two marks of the current—some "lacework" on the back, and a mark in the groin, where an ulcer formed—very indolent in healing. A second case was of an electrician at the hospital, whose hand clenched a live electrode and could not let go, but he suffered no serious after-effects. A third case was the most ghastly he had ever seen, that of a man in a power station who got 10,000 volts through his body, and was brought to hospital, where he lived for two days, with all four limbs almost entirely necrosed.

Dr. MACDONALD CRITCHLEY said that he had avoided the subject of lightning, which offered its own problems and difficulties, the greatest of which was the paralysis of both legs which was likely to come on after a shock. Inability to release the grasp was fairly common on prolonged contact in electrical shock. The shock, particularly in high tension, might throw a person right away from the conductor, or it might, on the contrary, render him unable to release his hold.

AMERICAN MATERNITY HOSPITALS

At a meeting of the North of England Obstetrical and Gynaecological Society, held in the University, Liverpool, on October 25th, with Dr. J. H. WILLETT in the chair, Dr. K. V. BAILEY (Manchester) read a paper on "The American Maternity Hospital."

Dr. Bailey said that during a recent visit to Canada and the United States he was privileged to see some of the finest hospitals on the continent of North America. He gave an account of the organization and working of six clinics, five of which had only been completed and opened during the last five years. He was struck by the fact that they were built and staffed with apparent disregard of expense, the sole object being the attainment of as efficient working as possible, so that it should be possible to obtain the best. The new Chicago Lying-in Hospital allowed outside physicians to deliver women in it, in addition to the regular staff. It was also the only one of the six hospitals which was wholly devoted to obstetrics and gynaecology, the others being obstetrical units in general hospitals. Most of the patients contributed a large share of the cost of their upkeep, and Dr. Bailey gave examples of the charges. He was struck by the general cleanliness and the atmosphere of efficiency. Every department appeared to be adequately staffed. He described the ante-natal clinics, illustrated the accommodation, and described their working. Full details were given of the methods of examination and recording. Ethylene and nitrous oxide gas were the favourite anaesthetics used. A great deal of trouble was taken in order to segregate suspect cases. The working of the laboratories, infant nurseries, and kitchens was described by Dr. Bailey in detail, as well as the teaching of the students and nurses.

Professor MILES PHILLIPS (Sheffield) thought there was no doubt that hospitalization would extend in this country. He stated that in Vienna 96 per cent. of women were confined in hospital, and in Budapest 95 per cent. The figure for Manchester was 54 per cent. He stressed the importance of doing away with the wearisome waiting of patients in ante-natal clinics, and thought that the ideal to be aimed at in obstetrics was a single room for every patient. He advised all the younger men to go abroad in order to study hospitalization.

Severe Puerperal Cystitis

Mr. T. N. A. JEFFCOATE (Liverpool) described a case of puerperal cystitis of unusual severity with sloughing of the bladder mucosa. This was caused by post-puerperal retention of urine and failure to catheterize. The whole of the bladder mucosa appeared to slough, and was passed in two parts, the surface of which was thirty-two square inches. The trigone was apparently not involved. The bladder contracted down greatly, and finally would only contain less than one ounce. It was subsequently dilated under anaesthesia, and when the patient was discharged from hospital its capacity was about ten ounces.

Professor W. GOUGH (Leeds) said that this was an example of the enormous recuperative powers of the bladder, which was also instanced in cases of partial cystectomy, where even as much as three-quarters of the bladder was sometimes removed, and yet it subsequently became a normal organ. Miss RUTH NICHOLSON (Liverpool) said that she had had a similar case, which followed ovariotomy. Her patient recovered completely following similar treatment to that exhibited by Mr. Jeffcoate.

Jaundice Complicating Pregnancy

Dr. C. P. BRENTNALL (Manchester) described a case of severe jaundice complicating pregnancy, treated by vaginal Caesarean section. The child weighed 3 lb. 12 oz., and lived for thirteen hours. The mother began to improve soon after the operation. She was finally discharged recovered. Dr. Brentnall particularly wished to call attention to the operation of obstetric hysterotomy, and discussed its advantages and limitations.

Dr. J. H. WILLETT (Liverpool), in discussing Dr. Brentnall's case, thought that the treatment was a very important contribution, and said that the accidents and disasters which occurred were brought about by unskilful surgery. Anterior section of the cervix simplified the evacuation of a three or four months' pregnancy from the uterus. Dr. J. E. STACEY (Sheffield) stressed the fact that it was important to evacuate the uterus abdominally when the mother's condition precluded further pregnancy, so that sterilization could be carried out. He did not think that there was any indication for vaginal delivery of a living child. Mr. P. MALPAS (Liverpool) referred to a patient with severe jaundice, commencing at the third month of pregnancy, who was delivered in the eighth month of a living child, both mother and child subsequently doing quite well. Professor PHILLIPS thought that haemorrhage was rather excessive when anterior hysterotomy was carried out, and also remarked that there was difficulty in delivery of a child after the thirty-second week. Professor GOUGH referred to a patient with severe jaundice in pregnancy accompanied by vomiting, who came into labour and delivered herself in twenty-four hours after rupture of the membranes. Improvement in the patient's condition commenced as soon as the membranes were ruptured.

Gynaecological Cases

Dr. J. W. BRIDE (Manchester) described a case of malignant change in an ovarian dermoid, and stated that in his experience this condition was rare, the incidence being given as about 3 per cent. The specimen was removed from a single woman aged 54. The tumour reached to just above the umbilicus, and completely filled the pelvis. At operation it was found to be adherent to the sigmoid colon and the pouch of Douglas. Histological examination proved the growth to be a squamous-celled carcinoma in a dermoid cyst. Dr. Bride discussed the literature on the subject.

Mr. T. F. TODD (Manchester) described a case of squamous carcinoma of cervix with metastasis in kidney. In June, 1934, the patient was treated by means of deep *x*-ray therapy and radium. The primary growth disappeared, and nine months later the patient began to complain of pain in the right loin. Investigations suggested that a pyonephrosis was present, and so right nephrectomy was carried out. The kidney showed a dilated pelvis, while the whole of its upper two-thirds was replaced by infiltrating tumour, similar to the primary.

CANCER OF THE UTERINE BODY

At the October meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland, with Dr. J. S. QUIN in the chair, Dr. BETHEL SOLOMONS showed three specimens of carcinoma of the uterus, all operated on during the month August September, 1935.

Case 1.—An unmarried woman, aged 52, never had trouble with her menstrual periods until four years before admission, when irregularity might be reasonably expected. For the past year the haemorrhage had become more severe. She had no other gynaecological trouble. Examination revealed a slightly enlarged uterus, and a diagnosis of carcinoma was made and hysterectomy was done.

The report of Dr. F. S. Bourke on the specimen was: "Naked eye, the uterine cavity is distended by a cauliflower-like mass, which has the appearance of an adenocarcinoma, but with little infiltration of the uterine wall. Microscopically, these were seen to be adenomatous polypi, which, in places, suggest a malignant change. Some of the glands showed an inflammatory exudate in their lumen, and some inflammatory infiltration of the stroma; the condition being one of carcinoma of the body of the uterus of an adenomatous type."

Case 2.—A woman, aged 57, married seventeen years, nullipara. She had had two large ovarian tumours, which were believed to be malignant, removed in the country in October, 1932 and 1933. She visited her doctor because of a discharge. She had no other trouble. He believed she had an inoperable malignant uterus, and sent her to hospital for radium treatment. Examination showed the uterus to be lying back and apparently fixed. It seemed to be a hopeless case of inoperable malignancy, but a diagnostic curettage was done. The curettings in this case were macroscopically and microscopically malignant. Total hysterectomy was decided on. The small intestine was adherent to the uterus in the region of the right cornu. The uterus when freed was found to be the size of an eight weeks pregnancy. It was soft, and, owing to the removal of the adnexa at the previous operations, it was difficult to use traction. The patient did well for eight days and then jumped out of bed when unobserved for a few moments. That evening the wound burst open and about four inches of small intestine extruded. The abdomen was closed and drained, and she did very well after a stormy convalescence.

Dr. Bourke's report on the specimen was as follows: "Sections show a typical adenocarcinoma of the body of the uterus of high maturity. There is some infiltration of the muscle wall, but the greater portion is proliferating into the cavity of the uterus. It is extending down towards the cervix."

Case 3.—A woman, aged 59, married thirty-two years, six children. She complained of a yellow discharge for three months, she also had pain in her side, and for fourteen days before admission the discharge was blood-stained. There was no loss of weight. Bimanual examination showed a much enlarged boggy body of the uterus with a normal cervix. Adenocarcinoma of the body of the uterus was diagnosed and total hysterectomy done. When the uterus was opened an endocervical carcinoma was apparent.

Dr. Bourke's report was: "Sections of the uterus show a thin-walled cavity with an uneven surface. This cavity was filled with blood-stained pus. The wall shows infiltration with leucocytes. The endometrium is replaced by masses of large atypical cells. This is a solid carcinoma. The cervix shows a similar condition of infiltration with a solid carcinoma of high maturity. The exit of the pus was obstructed by the internal os. The condition in the uterus appears to be an extension from the cervix."

Commenting on these cases Dr. Solomons said that an important question in carcinoma of the body of the uterus was, Should a diagnostic curettage be done? If the diagnosis was certain it should be avoided, in view of the chance of disseminating the carcinoma, especially by implantation in the vagina. If the diagnosis was doubtful curettage should be done. Certain points in the technique of total hysterectomy for carcinoma of the body of the uterus required mention. The vagina was plugged with gauze soaked in 3 per cent. picric acid. If the uterus was known to be septic or malignant the cervix was sewn up. During the operation no cutting or forked instrument of the vulsellum type should be placed in the uterus. Usually clamps placed on the broad ligaments acted as effective tractors, but in Case 2 these would not hold, owing to the previous removal of the adnexa. In Case 3 if this endocervical condition had been apparent Wertheim's operation would have been done, but the body of the uterus was much enlarged, and corporeal carcinoma seemed to be the correct diagnosis. The enlargement of the body proved to be due to a pyometra. What should be done? After consultation with Dr. Oliver Chance deep *x*-ray therapy was decided upon. From a study of these three cases the teaching that corporeal carcinoma was a disease of the nullipara and cervical carcinoma of the multipara would appear to be well founded, although no definite conclusion could be drawn from such a small number of cases.

Dr. QUIN said that in Dublin they were fortunate in having a very low percentage of malignancy in the uterus compared with other centres. This fact had struck Professor Schiller when he was recently in Dublin. Dr. Quin was inclined to agree with Dr. Solomons that the prognosis in the first case he had described was excellent. The second case was of a somewhat unusual nature, and it would be very interesting to watch its future progress. He himself had had under his care two cases of a somewhat similar nature, one for three years and the other for four years. Both patients were given prophylactic deep *x* rays after a total hysterectomy. The third case was also interesting on account of the double nature of the carcinoma. It was one of the cases in which prophylactic deep *x* rays would make the difference between cure and temporary alleviation.

Dr. F. S. BOURKE said that Case 1 had given him a little difficulty. It did not at first sight look malignant, but when sections were made there was no doubt at all that it was an adenocarcinoma. He did not know whether Case 3 was a metaplasia from the uterine cancer

or a spread from the cervix, but he believed it was the latter. He did not think there was any doubt that it was a uterine cancer.

Dr. D. J. CANNON agreed with Dr. Solomons in stressing the need for a diagnostic curettage. On general principles he objected to a curettage in malignant cases. After curettage for carcinoma of the cervix a mild endometritis usually occurred, and this, he thought, often explained the very stormy convalescence which frequently followed curettage. In doubtful cases he had no hesitation in doing a hysterectomy and making a diagnosis afterwards. Operations were still performed for so-called functional uterine bleedings: it was important in these cases to split the uterus and ascertain that carcinoma was not present. If he was in any doubt at all he did a complete hysterectomy and removed the ovaries from both sides before closing the abdomen. It was only in recent times that radium was supposed to be indicated in cancer of the body of the uterus.

Dr. G. C. DOCKERAY said he had seen a slide from the endometrium in Case 3, and it did not appear to him to be a metaplasia showing adenocarcinoma. It suggested to him a typical squamous carcinoma spreading upwards. Dr. R. M. CORBET did not see how diagnostic curettage could ever be entirely done away with; in his opinion it was a procedure which would always have to be done. He did not think that it was possible always to make a diagnosis of carcinoma from a naked-eye specimen, and if a diagnostic curettage was not done it would be necessary to perform a total hysterectomy in every doubtful case.

Dr. BETHEL SOLOMONS, in reply, expressed his belief that the infrequency of carcinoma of the cervix in the Irish Free State was due to good midwifery and the practice of performing trachelorrhaphies and amputations of the cervix. He did not believe in the necessity for deep *x*-ray therapy after hysterectomy for carcinoma of the uterine body unless there was a suspicion that the whole trouble had not been eradicated. He did not agree that a diagnostic curettage could be dispensed with, but if the diagnosis of corporeal carcinoma could be made with certainty curettage should not be done, because it might cause implantation metastasis. He did not agree that three weeks should be allowed to elapse between a diagnostic curettage and subsequent hysterectomy. He preferred hysterectomy to radium for cancer of the body, unless the woman was suffering from grave constitutional disease.

CORRESPONDENCE

Weil's Disease or Sewer-gas Poisoning?

SIR,—The following passage may be found on page 587 of vol. ii of Taylor's *Principles and Practice of Medical Jurisprudence*, ninth edition, 1934:

"In 1903 a case was treated in the London Hospital in which an attack of catarrhal jaundice was distinctly due to sewer gas.

"R. G., admitted to hospital December 12th, 1903. Came over 'queer' when at work in a sewer, shook all over, went home, vomited continuously for some hours, and off and on between November 30th, the day of onset, and December 12th, the day of admission, and in addition he had pains in abdomen and in joints. Became jaundiced on December 7th. Motions were white and very offensive. He had been a sewer man thirteen years, and had never had any similar attack. He had a headache on admission, but never showed any convulsions. He was discharged on December 30th quite well, and the jaundice had disappeared. This man said two of his mates had similar attacks to his own."

These symptoms correspond more closely with those of Weil's disease than they do with those presented by other sufferers from sewer-gas poisoning. N. Hamilton Fairley has drawn attention to the occurrence of Weil's disease in London sewer workers (*British Medical Journal*, July 7th, 1934, p. 10), and it is tempting to speculate that the above is an early record of the same association. Its retention as a case of sewer-gas poisoning seems open to question.—I am, etc.,

D. P. LAMBERT, M.D., D.T.M. and H.,
Saharanpur, U.P. Captain I.M.S.

Royal Mineral Water Hospital, Bath

SIR,—I am extremely obliged to you for the notice of the unveiling of the memorial tablet to Dr. William Oliver of Bath in the *Journal* of November 2nd.

I should like to take this occasion not only to thank you, but to let you know that before I returned to my old home the Bath City Corporation, the authorities of the Royal Mineral Water Hospital, and the medical profession in Bath had already determined to rebuild this free hospital on a new site and on modern lines, and at the same time to develop a research department in connexion with it, and thus make it a national centre. Sir John Farmer had already taken important steps in connexion with the research department.

I was asked when I came here to assist, so far as I was able, this most important project; but I should consider it almost an outrage on my part if I led anyone interested in this development to believe that I claimed to have initiated or even inspired this scheme.—I am, etc.,

Bath, Nov. 4th. F. JOHN POYNTON.

The Heart in Anaesthesia

SIR,—The wording of Dr. W. B. Primrose's letter of October 26th is somewhat obscure, but I gather he does not disagree that some form of artificial respiration is of primary importance for the successful performance of cardiac massage. Dr. Primrose's claim that an efficient alveolar ventilation is set up in the course of subdiaphragmatic compression of the heart is of much interest if it can be substantiated. In the meantime it seems advisable to rely on other methods of artificial respiration which are of unquestionable efficiency.

Dr. Arthur Mills, in a letter of the same date, asks for more definite information as to the stage at which cardiac irregularities are first liable to be induced during the induction of chloroform anaesthesia. This is not easy to supply, but I may refer him to some experimental observations recorded in a paper of mine published in *Heart* (1919, vii). If the heart be only *very slightly* affected with chloroform from the beginning of the administration it is not easily excited to exhibit ventricular extrasystoles. When 0.5 per cent. of chloroform vapour is administered to a cat by artificial respiration for fifteen minutes the heart responds to an intravenous injection of adrenaline with significant irregularities. Percentages of vapour under 0.5, given for the same or longer periods, do not, however, thus sensitize the heart, and we may surmise that percentages somewhat over 0.5, but given for briefer periods, act similarly. These observations apply definitely to the induction period only. In applying these observations to man certain factors must be taken into consideration. (1) The cat's heart shows a greater tendency to become irritable under chloroform than the human heart. (2) Artificial respiration affords the maximum effect of the chloroform. (3) The adrenaline test of irritability is a severe one. It seems probable, therefore, that the limit of vapour laid down for the cat under experimental conditions may be somewhat exceeded in clinical conditions and continued without risk of sensitizing the heart.

Dr. Mills's experience of several thousand administrations of chloroform up to the point of loss of consciousness

is a striking one, but such a procedure appears to demand considerable skill and experience. If excessive chloroform be given the heart may be sensitized and remain sensitized, in which case the change to ether may involve an element of danger. I trust these notes may be helpful to Dr. Mills. I may add that there are points in his letter which are *not* in accordance with experimental observations.—I am, etc.,

Marlow, Bucks, Nov. 2nd. A. GOODMAN LEVY.

Anti-scarlatinal Serum in Erysipelas

SIR,—I was greatly interested in the memorandum on this subject by Dr. W. H. Brazil in the *Journal* of November 2nd (p. 840), and I should like to record two interesting cases of my own in this connexion. These were striking in similarity.

Both were males, one over 40 years and the other over 50 years, who suffered from recurrent attacks of facial erysipelas. Both had had an initial severe attack, and those I had to deal with were in the nature of residua. Only infrequently were the recurrences severe enough to cause any marked constitutional disturbances. Local treatment did nothing to arrest the attacks, and the administration of stock vaccines also failed.

At the suggestion of a bacteriological colleague I tried anti-scarlatinal serum. Both men were given 10 c.cm. intramuscularly, and from that day their attacks ceased—at all events up to the time when I was last in contact with them, about three years ago, and the serum had been given about three years before that.

I have recently had under my care a case of erysipelas of the leg in which response to 10 c.cm. doses on two successive days was, as in Dr. Brazil's case, dramatic.

—I am, etc.,

Bakewell, Nov. 3rd. HUGH G. WATSON, M.B., Ch.B.

The Quality of Sunlight

SIR,—The summer in Iraq this year has been unusually hot, the shade temperature reaching 122° F. in August and 117° in September. It is hardly necessary to add there has been no rain and that the humidity has been low ; indeed, clouds are only now appearing in October.

A number of European residents have continued sunbathing all the time: swimming on Sunday mornings till 11 a.m. or noon, tennis in only shorts and shoes, and nude sun-basking were all commonplace. There were no cases of sunstroke, and a very good standard of health was maintained generally. One observed that followers of the sun cultus were deeply tanned in the spring and early summer, but by September, despite continued exposure, the tan had faded, usually till the skin was as pale as that of new arrivals from England. Those who went on leave to the Lebanon, Syria, or Egypt found that exposure to the sun such as was their custom in Iraq caused sunburn, often quite severe, while one young man was badly sunburned three days after returning to Scotland from Baghdad. On coming back after two or three weeks' leave their bronzed skins made a sharp contrast with those who had remained.

One supposes that similar observations must be common among medical officers in different parts of the Tropics, but I have been unsuccessful in tracing in the literature here available any explanation of the phenomenon, or experimental work on the subject. Information regarding this pigmentary bleaching would be gratefully welcomed, especially with reference to the actual changes in the skin and the light conditions which determine them, for we are particularly interested here in physiological responses to climate.—I am, etc.,

WALTER P. KENNEDY.

Physiology Department, Royal College of Medicine, Baghdad, Oct. 8th.

Treatment of Cardiospasm

SIR,—In a report of a special clinical lecture given at the Melbourne Meeting of the British Medical Association by Mr. H. S. Souttar on oesophageal obstruction, and published in the *Journal* of October 26th (p. 777), I was surprised at an omission in the treatment of cardiospasm. No mention is made of the very effective treatment of the condition introduced by Dr. A. H. Hurst of Guy's Hospital. It consists in passing a heavy indiarubber mercury bougie slowly through the contracting portion of the oesophagus. The condition, Dr. Hurst believes, is due to an overaction of Auerbach's plexus. The weight of the bougie overcomes the spasm, and it is allowed to remain *in situ* for about fifteen minutes before the patient has his meal. On withdrawal of the bougie it is found that the food passes successfully. The patient is taught how to pass the bougie himself—quite a simple matter after a little practice. He does this before he takes any meal, and it is found by experience that the periods of retaining the bougie *in situ* can be gradually lessened until it is done away with altogether.—I am, etc.,

London, N.1, Oct. 28th. C. HORWITZ.

Oleothorax for Tuberculous Empyema

SIR,—In a paper on the treatment of tuberculous empyema in the *Journal* of October 12th, Mr. M. P. Susman makes frequent reference to the use of oleothorax, and later in the same issue, in reply to a discussion, says that "Brompton Hospital experience with oleothorax was favourable, and fistula might be cured by this method." So far from the truth is this statement that it seems necessary to say that the treatment has found such actual disfavour that to my knowledge it has not been used here during the past two years. Prior to this it had been tried in a few cases, but with such indifferent results that it was given up. Indeed, it seems unreasonable that a treatment dependent on the known immiscibility of oil and water and the doubtful antiseptic value of gomenol should even appear successful, and it seems a pity that such abandoned therapy should be praised without the experience born of practice.—I am, etc.,

G. S. ERWIN.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.3, Oct. 30th.

Chronic Amoebiasis and Chronic Appendicitis

SIR,—I was much interested in Dr. W. Wilkinson's article on the above subject in the *Journal* of September 7th (p. 452), as I have just seen a case of subacute appendicitis in a British seaman recovering from an attack of amoebic dysentery. In this case the onset of typical appendicular symptoms was sudden, but for the previous fortnight the patient had complained of continuous dull pain in the right side of his back, which was relieved by the appendicectomy. The appendix was retrocaecal in position. Unfortunately the microscopical report on the specimen has not yet been received, but macroscopically it appeared to be the site of chronic amoebic ulceration. The liver was not enlarged.

I am informed by the medical staff of the Wuhu General Hospital that in their experience enlargement of the liver in cases of chronic amoebiasis is uncommon in China, apart from cases of abscess formation. I am indebted to Dr. Brown, superintendent of the Wuhu General Hospital, for permission to quote this case. —I am, etc.,

Wuhu, China, Oct. 14th. JOHN G. MORE NISBETT.

Electro-pyrexia

SIR,—As one who was present at Dr. C. B. Heald's interesting presidential address to the Physical Medicine Section of the Royal Society of Medicine, which was reported and annotated in the *Journal* of November 2nd, I should like to add emphasis to the statement which he made that electro-pyrexial treatments, where the temperature is raised above 101° F., should be administered only by a qualified practitioner working with a suitably trained nurse.

Like Dr. Heald I have been giving pyrexia treatments for a number of years, but have only administered ultra-short wave and inductothermy hyperpyrexia since May of this year, and in this time I have given ninety-six applications. I am already convinced, however, that it would be most unwise to delegate the administration of electro-pyrexial treatment to unqualified subordinates, though on account of the considerable time required for each application there might be a temptation to do so. While it is true, as Dr. Heald has said, that much clinical benefit can be secured by pyrexial treatments at temperatures of 101° to 103° F., it should be remembered that temperatures of approximately 105° F., maintained for a number of hours at each session, are essential in neurosyphilitic conditions, and 106.5° F. in gonococcal conditions, as these degrees of fever are generally bacteriolytic for the respective causative organisms. One would like to know the nature and extent of Dr. Heald's personal experience with high temperatures which has caused him to refrain from joining in their advocacy.

Another indication for use might be added to those which he gives—namely, conditions where electro-pyrexia will produce a much more speedy result than other methods, and in this connexion chorea might be mentioned. The chief indications at present for electro-pyrexia seems to be G.P.I., tabes dorsalis, taboparesis, disseminated sclerosis, chorea, Parkinsonian syndrome, gonorrhoeal urethritis, prostatitis, cervicitis, salpingitis, arthritis; chronic infective and rheumatoid arthritis; fibrositis, sciatica, and other forms of neuritis; intractable asthma; certain ocular lesions, etc.

I have found inductothermy a most satisfactory method of producing electro-pyrexia, because it fulfils the following conditions—namely: (1) it is safe and comfortable for the patient; (2) the apparatus is simple and convenient, silent in operation, and very compact and portable; (3) the cost is reasonable, it is easily installed, and is inexpensive to maintain.—I am, etc.,

London, W.1, Nov. 2nd. W. KERR RUSSELL.

Pink Disease

SIR,—I have recently read the paper entitled "Pink Disease," by Wood and Wood of Melbourne, in your issue of September 21st. I would like to call to their attention that they have overlooked one of the most important articles on this subject. The article I refer to was written by Dr. Alan Brown, physician-in-chief of the Hospital for Sick Children in Toronto, Ontario, and appeared in the *Archives of Pediatrics* (vol. xxxviii, October, 1921). We see a great deal of this disease owing to our long winter, and since that article we have had a great many more cases. It is undoubtedly a primary infection, and in the treatment one endeavours to raise the resistance of the child by all means, which include giving all known vitamins. This treatment is definitely stated by Alan Brown.—I am, etc.,

Niagara Falls, Canada, Oct. 22nd. HOWARD MCGARRY.

War and Peace

SIR,—The international declaration against war by 350 psychiatrists does not seem to show much in the way of constructive suggestion, apart from its appeal to the politicians that "the apparatus to ensure peace should be more efficiently organized." But all this is far too vague. The rise of the war spirit in our day would seem to result necessarily from the development of crowd psychology, itself the negation of individuality. In proportion as the individual man fails to develop his individuality, he becomes timid and mistrustful. From this feeling he seeks relief by various subterfuges, notably by escape into the crowd. In the crowd he feels himself for a moment big and powerful; he begins to look down on other crowds, and before long is even shouting defiance and threats at the rival throng. (Macaulay has said, "We know no spectacle so ridiculous as the British public in one of its periodical fits of morality"—and this is true of all nations.) The soil in which modern crowds chiefly grow is the great cities, especially those great metropolitan cities which form the core of States. National aggregations nowadays are little more than crowds.

The League of Nations was mainly the outcome of a genuine and widespread realization following the last war that the rivalries of the different national States would quickly precipitate another and a greater war if something were not done to prevent it. The mistaken assumption, however, was made that what these big aggregations called nations were failing to do could only be done by a yet bigger aggregation or super-nation. The pitiable results of this assumption must now (*pace* the politicians) be apparent to everybody: the world has steadily become more like an armed camp ever since the League of Nations was started. We have gone in the diametrically wrong direction—straight away from the individual instead of straight towards him.

Psychotherapists know that their patients are mainly people whose individuality has been in some way repressed or thwarted, and cure consists essentially in helping these individuals to express themselves. Now, the growth of crowd psychology is only this on a big scale; crowds consist mainly of people who, if not neurotic, are at least subneurotic, and if a cure is to be effected it must simply be the carrying out on a large scale of what the psychotherapist does within his own little clientele. Peace by itself is a negative and therefore an unnatural thing. Obviously war will only be eliminated when a "moral equivalent for war" is found. And this is but the psychologist's "sublimation" applied all round. Hence the best war prophylactic is to get individuals of Western civilization more and more into the conditions which make development of individuality possible. That is to say, the country districts most rapidly regain ascendancy over the urban, because in country communities a man is at least able to know his neighbour and to co-operate with him on something like a full human footing, whereas in the great city, if, as is unlikely, he knows his neighbour at all, the mutual contact is of the slenderest and most superficial or specialized nature. The crowd is in essence non-social.

What, then, if nothing is done about this? What if the seed-beds of crowd psychology are allowed to spread? We as doctors know that when Nature is persistently defied she takes her revenge, and often violently. If big cities are the breeding grounds of the mob mentality, and therefore destructive of man's individuality or soul (his chief *raison d'être*), and if we do not use our reasoning powers and quickly reverse this tendency, then Nature may suddenly do it for us, and in a violent way. The bombing aeroplane is, I take it,

primarily designed for breaking up big aggregations of human beings. Our Government is telling us to get ready to protect ourselves against possible air raids. If war spreads—for example, from Abyssinia—the bombing plane will get to work on a big scale, and there will obviously be a somewhat precipitate movement from our great cities "back to the land." *Verb. sap.* We had better do it now rather than wait till it is forced on us. Country life and country work make the best prophylactic against mob psychology, and therefore against war. Here is a suggestion, then, for the 350 psychiatrists.—I am, etc.,

North Queensferry, Fife, Oct. 30th. A. J. BROCK.

Lambeth Degrees

SIR,—The name of Caleb Coatsworth in Dr. Wall's list recalls a *cause célèbre*: the trial of Spencer Cowper and others for murder. There is a short biography of Coatsworth in Munk's *Roll* (he was one of the comparatively few members of our profession who have made large fortunes), but his only interest for us is that he was a witness for the prosecution in the trial of Spencer Cowper and others in 1699, a trial to which Macaulay (in Chapter XXV of the *History*) devoted some of his most vivid pages. According to Macaulay:

"The case against the prisoners rested chiefly on the vulgar error that a human body, found, as this poor girl's body had been found, floating in water, must have been thrown into the water whilst still alive. To prove this doctrine the counsel for the Crown called medical practitioners, of whom nothing is now known except that some of them had been active against the Whigs at Hertford elections."

This trial was reprinted in a collection edited by H. L. Stephen in 1899, and as Coatsworth's evidence is short it can be quoted in full:

Dr. Coatsworth: I have not seen many drowned bodies to make observation upon; but it is my opinion, that every body that is drowned, is suffocated by water passing down the windpipe into the lungs upon respiration; and at the same time, the water pressing upon the gullet, there will be a necessity of swallowing a great part of it into the stomach; I have been in danger of being drowned myself, and I was forced to swallow a great quantity of water. If a person was drowned, and taken out immediately, as soon as the suffocation was effected, I should not wonder if there were but little water in the stomach and guts; but if it lay in the water several hours, it must be very strange if the belly should not be full of water; but I will not say it is impossible it should be otherwise.

Cowper: I desire to know whether this gentleman attempted to drown himself, or was in danger of being drowned by accident?

Dr. Coatsworth: It was by accident: I was passing up the shipside, and took hold of a loose rope instead of the entering rope, which failing me, I fell into the water.

Cowper: But you struggled to save yourself from drowning?

Dr. Coatsworth: I did so; I have seen several persons that have been drowned, and they have lain several days, until by fermentation they have been raised; but I never made my observations of any persons that have been drowned above six hours.

Jones (Counsel for the Crown): Did you ever hear of any persons that, as soon as they were drowned, had swam above water?

Dr. Coatsworth: I have not known such a case.

Cowper: Did you ever know, Sir, a body that was otherwise killed, to float upon the water?

Dr. Coatsworth: I never made any observation of that.

Since the defence was that Sarah Stout committed suicide in a fit of melancholia the point of Cowper's questions is obvious. For the defence Dr. Morley (possibly Dr. Christopher Love Morley) and William Cowper, the celebrated anatomist, reported experiments on dogs which they had drowned; no water was found in the stomachs. A shrewd counsel for the prosecution might have made the point that Cowper's experiment ("I caused three dogs, when alive, to be suddenly plunged under water till they were stifled") was not highly relevant. But then Coatsworth's evidence was not relevant either. Sarah Stout was drowned on March 13th, and the post-mortem examination made on April 28th. But it is improbable that any of the anatomical evidence had much effect on the jury. The evidence as to the state of mind of Sarah Stout was conclusive. Spencer Cowper is, I believe, the only man who, having stood a trial for murder, has become a judge of the High Court.—I am, etc.,

Loughton, Nov. 2nd. MAJOR GREENWOOD.

Voluntary Euthanasia

SIR,—I yield to no man in my admiration of Lord Moynihan's humanitarian motives, and would often prefer to err with Lord Moynihan than be right with Lord "Stoic." But has not Lord Moynihan in his remarks, as reported in the newspapers, anent the new Voluntary Euthanasia Society, allowed his kindly heart to get the better of his head? I assume we are all 100 per cent. with him in advocating euthanasia (easy dying), but—and it is a big "but"—advocating "easy death," which is the object of this misnamed society, is a very different proposition. It is a claim, never before made and one which I hope will never be made legal, for medical men to act as executioners—to deliberately terminate human life. Hitherto there have been only two occasions when the universally recognized ethical principle against deliberately terminating human life has been suspended—namely, in the case of capital punishment by the State and the killing in warfare. The claim of this society is against the moral principles of the sanctity of human life. There is surely no analogy between the problem of anaesthesia in childbirth and the soothing of suffering, and the yielding to the altruistic "suicide" proposed. The suggestion cuts right across the principles of every school of morals and ethics and the whole Hippocratic tradition. It is no part of a doctor's duty to decide what is the value of life for his patient, even a life of suffering and apparently of hopeless outlook. It is not for him to hesitate about attempting to restore life to the would-be suicide because, being "down and out" or miserable, he sought death. It is outside his province: technically, would he not be "compounding a felony"?

The mysteries of life and suffering have been sneered at, with little understanding of the great inwardness of things and the designs of the great and the eternal *vis-à-vis* the little and the temporal. What is aimed at by this society would eventuate in giving a helping hand to the would-be suicide and allowing sentimentality to overrule our moral and ethical standards. Let the cobbler stick to his last and the doctor to his great calling.—I am, etc.,

London, S.W.1, Oct. 26th. REDMOND ROCHE.

Medical Science and Social Progress

SIR,—Lord Dawson, in his address on medical science and social progress (November 2nd, p. 829), rightly urges that the fertility of defectives should be checked. However, he recognizes that the carriers of mental defect are many times more numerous than the actual defectives, but says that sterilization would not touch this (by far the biggest) part of the problem. Therefore I beg that you will again allow me to give my, in the long run, all-sufficient sociological formula.

1. There should be a law that no woman in the poorest classes may have more than two confinements.

2. Sterilization and abortion should be available to any person who has had two confinements or has two children.

My idea is that the people in the poorest classes should have less than three children per family, and the others not less than three.—I am, etc.,

London, S.W.15, Nov. 2nd B. DUNLOP, M.B., Ch.B.

The Status of the Ship Surgeon

SIR,—In the *Journal* of September 14th there was an interesting letter on this subject. Dr. Hamerton tells us that he has made several voyages in different types of ships, and on the last three of them had to perform major operations for acute abdominal emergencies. This, I hope, is a very unusual experience for a ship surgeon. It would be interesting to know what was the result of his three major operations.

There must be a large proportion of medical men who, like myself, take engagements from time to time as ship surgeon, and who, like myself, have never done a major operation in their lives, and—without any reflection on their professional capacity—are not competent to undertake one, and would not consider themselves competent. How many general practitioners would dream of attempting a major operation even under the conditions obtaining at home? Any case requiring such operation they pass on to a surgeon who has specialized in surgery. Now compare the position of the ship surgeon on one of the smaller liners with that of the general practitioner ashore. None but the largest ships provide an operating room or any trained nurses. Unless there happens to be another medical man on board there will be no one—except the ship surgeon himself—qualified to give an anaesthetic. The difficulties of maintaining aseptic technique must be actually experienced to be adequately realized. On the top of all this there is the added difficulty of the movement inevitably associated with a ship at sea.

Dr. Hamerton contends that "it is unfair to expect a man to be able to deal with such common emergencies" (so he terms these major abdominal conditions) "on board ship . . . unless he is given adequate opportunity for post-graduate study." I venture to go further than this, and to contend that no one who has not had any experience of major surgery would be justified in attempting any abdominal operation on board ship, and that no amount of post-graduate study would solve the difficulty unless such study included the actual practice of major surgery—a hardly practicable project. Where the condition is one of extreme urgency it is indeed a terrible responsibility to be thrown upon the ship surgeon. Whatever he decides, the chances are almost certainly against the patient. If he attempts operation—without experience, and without any of the requisites for a successful result—the patient will almost inevitably die; if he holds his hand and adopts palliative measures the result is the same. In such a predicament—where no competent surgeon is on board—the decision must rest with the individual ship surgeon. Personally, if it be deemed possible to weigh the chances where the scales are so heavily weighted, I should consider that the balance might just turn in favour of holding one's hand. If the patient survived he would, of course, be transferred to hospital at the first port.

There are other points of interest raised by Dr. Hamerton. One suggestion he makes is that the shipping companies should have a rota of men *engaged in active practice*, on whom they could call at regular intervals. Dr. Hamerton himself, although—as he states—engaged in general practice, is apparently in the happy position of being able to leave his practice whenever he feels inclined to make a voyage as ship surgeon; but how many practitioners could do this without serious detriment to their practice? Dr. Hamerton's other suggestion—that opportunity for post-graduate study should be given at the shipping company's expense—is excellent, if only the shipping companies could be made to see it! The suggestion has frequently been made. Efforts to provide for such post-graduate study at the ship surgeon's own expense have been started and have been made public in the pages of our *Journal*; but these, of course, could only attract those who have taken up sea service as a permanent occupation.

But the fact remains that, unless the shipping companies can procure the services of competent "surgeons" (not physicians or general practitioners without experience of major surgery) for every ship—an ideal which is hardly attainable—the acute abdominal emergency at sea constitutes an almost hopeless problem for the ship surgeon who has not specialized in surgery.—I am, etc.,

At Sea, Oct. 2nd. OCCASIONAL SHIP SURGEON.

An Amblyopia Reader

SIR,—The writer of the review (*Journal*, October 26th) on an *Amblyopia Reader* has evidently failed to grasp the object with which this book has been compiled. The various types correspond to Snellen types at six metres distance—obviously an important point. The idea of the black and orange lettering is *not to dissociate* the eyes as in the well-known "Friend" test, which prevents convergences, but to associate the eyes as regards the relation between accommodation and convergence in giving the amblyopic eye at least an equal chance as regards retinal rivalry. The "high degree of ocular balance necessary to hold such difficult printing in proper view" is exactly that exercise which is necessary for all cases of heterophoria, and the "phenomenon known as the struggle of the retina," better described as retinal rivalry, is reduced to a minimum for amblyopic cases by this method of education.—I am, etc.,

London, W.1, Oct. 31st. MARGARET DOBSON.

Classification for Medical Libraries

SIR,—On various occasions medical men have asked my advice about the arrangement of their private collections of reprints, and have been interested to see the system of classification used in this library for the last fourteen years for the arrangement of reprints as well as books on the shelves. The scheme was approved as a thesis for the diploma with honours of the Library Association in 1931, and has recently been revised and brought up to date.

From time to time I receive requests for a copy of this classification from librarians, who express surprise that it has not been printed. These requests have recently become so numerous that I am led to believe there is a real need for such a publication. I have accordingly had estimates prepared for issuing a small edition in the form of a cloth-bound volume of 144 pages, royal 8vo, containing not only the schedules of the classification, but also a full explanatory introduction, local list, index of parasites, and alphabetical subject index. I am willing to undertake the publication if a sufficient number of promises to purchase be obtained in advance to ensure a reasonable proportion of the cost of production, and I could probably issue the book by the spring of 1936. Those interested would therefore oblige by notifying the undersigned at their earliest convenience, stating how many copies they would be willing to purchase at the price of 10s. 6d. each.—I am, etc.,

CYRIL C. BARNARD,
Librarian, London School of Hygiene and Tropical Medicine.

Keppel Street, W.C.1, Nov. 4th.

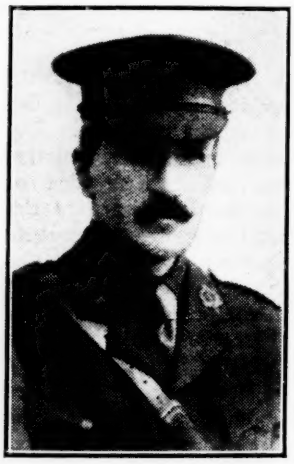
Obituary

W. G. RICHARDSON, F.R.C.S.

Consulting Surgeon, Royal Victoria Infirmary, Newcastle

Mr. William George Richardson of Keswick, a well-known Northumberland and Durham surgeon, who retired from active practice some years ago, died on October 27th at the age of 72.

The fifth son of Edward Richardson of Cotfield House, Gateshead, he was educated at the Leys School, Cambridge, of which he was one of the original pupils. After studying medicine at St. Bartholomew's Hospital and at Newcastle-on-Tyne, he graduated M.B.Durh. in 1886, taking the B.S. and the M.R.C.S. in 1887, and becoming a Fellow of the Royal College of Surgeons of England in 1890. He then served as senior house-surgeon at the General Infirmary, Sheffield, assistant demonstrator of operative surgery in the University of Durham College of Medicine, and surgical registrar at the Royal Victoria Infirmary, Newcastle-on-Tyne. He was for many years a member of the surgical staff of the Royal Victoria, being appointed consulting surgeon on his retirement. He was a keen Territorial, attaining the rank of lieutenant-colonel R.A.M.C.(T.) and being awarded the Territorial Decoration. During all the war years he acted as colonel of the 1st Northern General Hospital. He was elected a member of the British Medical Association in 1889, and when the Association held its Annual Meeting in Newcastle in 1893 he served as Honorary Local General Secretary.



Mr. Richardson won the Heath scholarship at Newcastle in 1904 for his prize essay on "The Development and Anatomy of the Prostate Gland, its Injuries and Diseases, and their Treatment." He also contributed papers to the *Lancet*, the *Northumberland and Durham Medical Journal*, and in 1912 to the *British Medical Journal*, on "Appendicitis, the Results of Operation in 619 Cases"; but in general he was diffident in publishing the results of his surgical work. He was a lover of the Lake District, and worked hard for the preservation of its amenities, as a member both of the local National Trust Committee and of the Keswick Parish Council.

Perhaps his best surgical results were with bone cases, and these were obtained with very simple tools. He was a very expert mechanic, and in his workshop he could make anything from a fishing rod to a greenhouse or a gate for the private drive to his house.

Mr. Richardson married Sarah, daughter of the late Dr. George Arnison of Allendale. She died some years ago, and they had no children.

Professor RUTHERFORD MORISON writes:

The death of Mr. W. G. Richardson, F.R.C.S., consulting surgeon to the Royal Infirmary, Newcastle-on-Tyne, is to me a great personal loss. I have known him for more than fifty years. He was my chief assistant, first in a general practice at Hartlepool and later in a private hospital in Newcastle-on-Tyne, and in the Royal Infirmary until he joined the senior staff. He was the straightest man I have known: his word was as good as his bond. Everyone trusted him. As a surgeon he was thoughtful, original, capable, and thorough in all his work, so that his results were unsurpassed. He was not latterly a surgical enthusiast, and never robust, so that when the opportunity came he resigned before his term of office had expired and left Newcastle for the English Lakes, which he worshipped. He bought land, built a house, made a garden, and spent the last ten years of his life busily engaged in nature study and experiments on improved methods of horticulture with entire satisfaction, and wished for nothing more, though he occasionally operated in Keswick Hospital when requested.

W. ADAMS FROST, F.R.C.S.

Consulting Ophthalmic Surgeon, St. George's Hospital

Mr. Adams Frost, whose death took place on October 25th, retired from the active practice of his profession nearly thirty years ago, and in consequence his real eminence as an ophthalmic surgeon is little known to the younger members of the profession. But his work as librarian of the Ophthalmological Society for twenty-one years made the Bowman Library one of the best ophthalmological libraries in existence, and should not be forgotten.

William Adams Frost was born in 1853, the son of Charles Maynard Frost, surgeon, of Ladbroke Square. He was educated in London, and entered St. George's Hospital in 1870. He was a successful student, was prizeman of the school in 1874, from which he took the M.R.C.S., and was house-surgeon to the hospital. Frost began his study of ophthalmology at the Central London Ophthalmic Hospital, and, having obtained the F.R.C.S. in 1878, was appointed ophthalmic registrar at St. George's in succession to McHardy. In 1881 he was elected assistant ophthalmic surgeon to St. George's, as junior to Mr. R. Brudenell Carter. Not long afterwards he joined the staff of the Royal Westminster Ophthalmic Hospital, and was also on the staff of the Victoria Hospital for Children for some years. He won the Middlemore prize of the British Medical Association in 1882 and again in 1886. When Brudenell Carter retired from St. George's in 1892 Frost succeeded to the senior post and worked till 1906, when he retired and went to live at Forest Row. During the war he served as ophthalmic surgeon to the London County War Hospital at Epsom. Late in life he was attacked by glaucoma, which, in spite of all that could be done, left him very gravely handicapped. Towards the end he was practically blind, yet he never lost heart, and faced his disabilities with characteristic courage.

Mr. Frost is best known through his magnificent *Atlas of the Fundus Oculi*. In this work he had the assistance of Mr. A. W. Head; the result was an atlas, the best on the market for many years, which has been used for teaching purposes all over the world. The plates are unsurpassed even to-day. He also wrote a short students' manual in Cassell's series in conjunction with Mr. Carter. His ophthalmoscope is a beautiful instrument, but rather more complicated in structure than the better-known Morton instrument; while his artificial eye has been a stand-by for the teaching of refraction for years. As a teacher Frost was at his best in the wards and out-patient department, where his remarks would often be enlivened by a humorous sally. In set lectures his rapid delivery made him at times rather hard to follow. He was keenness personified in all he undertook, and he published many papers in the *Transactions of the Ophthalmological Society*, the most notable of which is probably his exhaustive article on pulsating exophthalmos, in the third volume (1883).

Mr. and Mrs. Frost celebrated their golden wedding more than four years ago. Much sympathy will be felt for his widow in her bereavement.

Dr. CHARLES FREDERICK RUMBOLL died on October 23rd at his home in Melksham, Wilts, at the age of 75. He was born at Calne in that county in December, 1859, and was educated at Epsom College, the University of Durham, and St. Bartholomew's Hospital. In 1882 he obtained the diploma M.R.C.S., and two years later graduated M.B.Durham. In 1886 he became B.S., and proceeded M.D. with honours in the same year. He conducted a large practice in Melksham, and was surgeon to the local cottage hospital. Dr. Rumboll was a keen supporter of the Volunteer movement, and held the Volunteer Decoration. He was major and honorary lieutenant-colonel of the 4th Wilts Regiment, and during the war acted as president of the Melksham tribunal. He was also medical officer of the Melksham Red Cross Hospital. He was admitted as barrister-at-law of the Inner Temple in 1897, and later became Deputy Lieutenant for the county of Wiltshire. He had been a member of the British Medical Association since 1908, and in 1915 was chairman of the Trowbridge Division. A colleague writes: As doctor, lawyer, soldier, and Churchman Dr. C. F. Rumboll will be missed not only in Melksham but throughout Wiltshire. It was his study of the law which stood him in such great stead in later years, when as chairman of the Melksham Bench he was noted for his legal acumen and his just and courteous dealings with the cases brought before him. As senior medical officer to the Melksham Cottage Hospital he was enthusiastic for the well-being of that institution, and as chairman of the building committee for the new hospital, rendered possible by a considerable legacy recently bequeathed, he rendered most valuable assistance in the formulation of the proposed plans. The Church of St. Michael and All Angels was very dear to him, and he had worshipped there all his life. He was a church councillor, and for a great number of years he was churchwarden. Both he and his wife gave many gifts to the church, including many vestments and, what is perhaps a more permanent memorial, the rood screen so often admired by visitors. He was an authority on all matters pertaining to the Church, and also to the history of the town and district. As a doctor he was loved dearly by his patients, and notably by the children, who seemed to have a special place in his heart. Dr. Rumboll leaves a widow, formerly Miss Edith Cross, second daughter of the late William Henry Cross, B.A., J.P., who was for many years clerk to the governors of St. Bartholomew's Hospital.

On October 12th the death occurred at Nantwich, Cheshire, of Dr. FRANK EDWARD MATHEWS, in his seventy-fourth year. He was the son of the late William Mathews, surgeon, of Nantwich, and studied medicine at St. Bartholomew's Hospital. In 1884 he took the L.S.A., and in 1885 the diplomas L.R.C.P., M.R.C.S. In his student days he intended to devote himself to surgery, but owing to his father's ill-health he had to take up general practice immediately after becoming qualified, when he began the very successful conduct of the practice at Nantwich in which his father had been engaged. He retired from active work about eight years ago. He was a member of the Local Medical and Panel Committee for the county of Chester from the inception of the National Insurance Act. After his retirement Dr. Mathews took up public work, and served as the representative of Nantwich on the Cheshire County Council, which body appointed him one of its representatives on the County Insurance Committee, thus giving him an opportunity of continuing to serve on the Cheshire Local Medical Committee. He was a justice of the peace for the county of Chester, and was for many years a prominent Freemason. He served for a year in Malta as a temporary officer in the R.A.M.C. He lost his only son, killed in action in Mesopotamia in 1916, and his wife very shortly afterwards. Dr. Mathews was a very successful and much-beloved practitioner, and was possessed of a delightful personality. His surgical skill was much above that of the ordinary general practitioner, and his professional opinion and help were greatly appreciated by his local colleagues. He had been a member of the British Medical Association for over forty years. His death is felt as a great loss not only by those who were his patients but also by his fellows in the local profession, who held him in the highest esteem and regard.

The death occurred on October 18th, with tragic suddenness from pneumonia, of Dr. WILLIAM ALLAN HARPER of Kilmacolm, Renfrewshire. Dr. Harper was a student of Glasgow University, where he graduated M.B., Ch.B. in 1924. He took up practice in Kilmacolm some six years ago, where, by dint of ability and hard work, he had built up an extensive connexion. Before going to Kilmacolm he assisted the late Dr. Penney at Rothesay, where he was a general favourite among the patients, for whom he at all times did his utmost. A sound, able doctor, by his untimely death the profession has lost one for whom the future bore great possibilities.

W. W. M.

Dr. ALEXANDER ANDERSON, who died recently at Mirfield in Yorkshire, was for over forty years in practice in that neighbourhood, and had been one of the original members of the medical staff of Mirfield Memorial Hospital. He was born in 1849, and studied medicine at the Universities of Aberdeen and Edinburgh. After graduating M.B., C.M.Aberd. in 1875, with highest honours, he proceeded M.D. in 1878. Before settling down into general practice he was a house-surgeon at the Huddersfield Royal Infirmary. He had been a member of the British Medical Association for forty-one years.

Medico-Legal

UNSUCCESSFUL ACTION AGAINST A PANEL DOCTOR

Mr. Justice Charles, sitting without a jury in the King's Bench Division on October 29th, dismissed an action in which a father claimed damages against an insurance practitioner for alleged negligence in the treatment of his daughter. The father stated that his daughter had been under the doctor's care for five or six months with some gastric trouble. At 10.30 p.m. on December 1st, 1934, she became exceedingly ill. The father told the court that he went to the doctor's house, some two minutes away, and said, "Betty is doubled up with pain and can't straighten herself; I have propped her up in a chair. She is vomiting, and the vomit is frothy and tinged with blood." The doctor, he said, sat for six minutes by the clock with his head resting on his hand without speaking, and then uttered the one word "constipation." He then, said the father, handed him a small bottle of medicine, which he said would ease the pain. The father had sat up all night with his daughter and in the morning had gone back to the doctor, who had returned to the house. Immediately on hearing where the pain was, the doctor had rushed down and telephoned for an ambulance, and the daughter had been taken to the Battersea General Hospital. Mr. J. R. Lee, senior surgeon at the hospital, gave evidence that he had operated on the daughter for a perforated chronic gastric ulcer—a condition which he had never seen before in so young a patient. She had seemed to recover well, but two days later had died of pneumonia. He said that the mortality from perforation was very high if operation were left until after the "latent period," which set in some two or three hours after the acute symptoms first showed themselves.

The father's case broke down when he was cross-examined by Mr. Morris, K.C.; he admitted that he had made no special appeal to the doctor to come at once because his daughter was desperately ill, and that, although his younger daughter had come in at midnight, he had not sent her to make another attempt to get the doctor to come. Moreover, he admitted that he had only been dependent on the daughter's earnings to the extent of £1 a week, practically all of which had been expended in keeping her.

Mr. Justice Charles remarked at this point that he did not see what the case was about. He did not believe for a moment that the doctor had sat still for six minutes and then

said the one word "constipation." The action was a "pounds, shillings, and pence" one, and it failed. He did not in any way accept the account which the father had given of the happenings on the night in question, and he was not satisfied that the doctor had acted in any way improperly.

The defence was conducted under the instruction of the Medical Defence Union.

Universities and Colleges

UNIVERSITY OF OXFORD

The Theodore Williams Scholarship in Physiology, 1935, has been awarded to J. N. Mills (New College).

UNIVERSITY OF CAMBRIDGE

At a congregation held on November 2nd the following medical degrees were conferred:

M.D. (*honoris causa*).—J. A. Ryle, M.D.Lond., Regius Professor of Physic.

M.D.—G. L. F. Rowell, R. S. Stacey, E. F. Skinner, J. M. Wallace.

M.B., B.CHIR.—T. B. Jones.

M.B.—S. J. Hadfield, R. I. N. Greaves, R. H. Brown.

UNIVERSITY OF GLASGOW

At the graduation ceremony held on November 2nd the degree of M.D. was conferred on W. S. Burnet.

UNIVERSITY OF BIRMINGHAM

Course in Neurology

A special course in neurology for post-graduates preparing for the Diploma in Psychological Medicine of the Conjoint Board, and other practitioners who may wish to attend, has been arranged by the Faculty of Medicine of the University. The course will be held in May, June, and July, 1936, as follows. At General Hospital: May 5th, 12th, and 19th, at 2 p.m., neurological ophthalmology. At Queen's Hospital: May 5th, 12th, 19th, and 26th, June 9th, 16th, and 30th, and July 7th and 14th, at 3.30 p.m., neurology; May 5th, 12th, 19th, and 26th, and June 9th, at 5 p.m., neuropathology; July 7th and 14th, at 5.15 p.m., radiology of the nervous system. At Cripples Hospital, Broad Street: June 16th and 30th, at 4.45 p.m., neurological orthopaedics. The fee for the course is £5 5s., payable in advance to the secretary of the University, Edmund Street, Birmingham.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

A quarterly meeting of the Royal College of Physicians of London was held on October 31st, with the president, Lord Dawson of Penn, in the chair. Dr. A. Ramsbottom, Dr. A. Feiling, Dr. O. L. V. S. de Wesselow, Dr. E. H. Kettle, Dr. R. H. Miller, and Dr. P. H. Manson-Bahr were elected councillors.

The following were elected representatives: Dr. H. L. Tidy, on the committee of management of the Conjoint Board; Dr. A. S. Barnes, on the court of governors of the University of Birmingham; Dr. John Hay, on the court of governors of the University of Liverpool; Sir Stanley Woodwark, on the Central Council for District Nursing; and Dr. Arthur MacNalty, on the executive committee of the Imperial Cancer Research Fund.

The president announced the award of the Jenks Scholarship to John Douglas James, late of Epsom College, and the appointment by the council of Dr. D'Arcy Hart to the Milroy Lectureship for 1937. Dr. R. D. Gillespie was appointed a delegate to the Fourth Biennial Conference on Mental Health in January, 1936.

Membership

The following candidates, having satisfied the Censors' Board, were admitted Members of the College:

Franklin Bicknell, M.B.Oxf., Thomas Colver, M.B.Sheff., John Howard Fisher, M.B.Sydney, Arthur Evans Francis, M.D.Lond., George Edward Godber, M.B.Oxf., John Stuart Harper, M.B.Aberd., William Albert Hawk, M.D.Toronto, Thomas Shirley Hele, O.B.E., M.D.Camb., John Locke Lovibond, M.B.Camb., William McCartan, M.D.Belf., James Robertson Monro Mackie, M.D.Aberd., Robert Walsh Mussen, Surgeon Commander, R.N., M.D.Belf., Lionel Everard Napier, L.R.C.P., Neville Christopher Oswald, M.B.Camb., Mahankali Seetharama Rao, M.D.Madras, Kenneth Moorhouse Robertson, M.D.Lond., William Stuart Tegner, M.B.Oxon, Samuel Edward Turvey, M.D.Manitoba, John Henry Walters, L.R.C.P., Sydney Lawrence Wright, M.D.Lond.

Licences

Licences to practise were conferred upon the following 140 candidates (including seventeen women) who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board, and have complied with the necessary by-laws:

M. M. Ali, I. C. Allen, W. G. R. Ashley-Emile, E. Ashman, G. Bair, Margaret Ball, A. B. Barbour, K. E. Barlow, J. E. M. Barnes, H. H. F. Barns, P. N. Baruah, W. M. Beattie, H. B. Birnbaum, L. J. Blay, G. L. Broderick, J. A. B. Burnett, W. A. Burnett, A. Z. Butt, T. D. Chablani, Freda M. Chalkley, S. L. S. Chiew, Priscilla B. Clark, E. R. Coleman, J. D. Cooper, R. N. B. Cridland, H. W. F. Croft, N. Cruickshank, G. M. Curtois, B. Datta, D. R. Davies, H. L. Ellis, G. A. Ewen, R. D. Ewing, J. V. L. Farquhar, W. Fielding, G. M. Fleming, Daireen I. Forster, T. D. Fraser, E. D. B. Freedman, J. French, S. E. Furber, T. H. T. Gautby, P. R. Gavin, S. G. Gordon, D. W. F. Gotla, A. A. Hakeem, P. B. Hanbury, C. W. McN. Harvey, B. B. Hickey, G. S. Hodge, G. A. Hodgson, R. J. House, W. Hughes, T. G. Humby, R. S. Hunt, C. A. Hutt, R. A. Johnson, D. Joy, E. W. Knowles, J. W. Lacey, C. Langmaid, B. Lee, D. N. Leeming, J. I. Lesh, W. M. Lippitt, H. S. Lohgarh, R. G. M. Longridge, I. B. McCrae, K. G. F. Mackenzie, Ivy M. Massick, Dorothy V. Mazel, S. C. Mehta, H. C. de B. Milne, D. W. Moynagh, A. Mukerji, R. Mundy, A. H. G. Munro, E. G. Murphy, Moira Murray, A. A. K. Naqsh-Bandi, S. G. Nardell, J. A. V. Nicoll, A. R. H. Oakley, T. D. W. O'Flynn, C. W. F. Outred, S. Paletz, G. W. Palmer, Nora M. Pettitt, G. B. S. Pimblett, Dorothy S. Pope, D. A. R. Pritchard, C. N. Pulvertaft, J. D. Raftery, C. O. Ribeiro, D. T. Richards, Florence G. Richards, M. S. Richmond, C. G. Rob, E. T. Roberts, J. M. Robins, G. S. Robinson, H. D. H. Robinson, P. A. Robinson, G. Rogers, O. N. Roussel, E. B. Rowe, Millicent I. Rowland, L. M. Rubein, A. E. K. Salvi, H. N. Savage, S. K. Sen, J. A. Seymour-Jones, D. Singh, Marjorie Smail, T. Smallhorn, A. C. Spence, S. Stein, J. Stern, L. D. Stone, J. Suchet, R. H. A. Swain, J. R. Sweeting, Phyllis J. M. Sykes, R. A. Thatcher, F. B. Thomas, B. Thornley, R. F. Tredgold, A. R. M. Waffarn, J. T. Waldie, Rosemary C. Walker, J. St. J. F. W. Wallace-Collett, J. R. Wardley, Norah E. Weatherhead, W. R. Welply, D. O. Wharton, C. E. G. Wickham, Sheila M. R. Williams, S. L. Williams, J. D. Wilson, Hilda C. Woods.

The following diplomas were granted, jointly with the Royal College of Surgeons:

DIPLOMA IN PUBLIC HEALTH.—K. F. Alford, G. Busuttil, P. J. L. Capon, A. F. Cook, E. H. Hall, P. N. Kapur, A. A. Miller, C. D. Newman, Constance L. Taylor.

DIPLOMA IN CHILD HEALTH.—R. H. Bailey, D. S. Bateman, C. A. Birch, A. M. R. Cann, G. Davison, M. El-Diwany, J. H. Ebbs, L. A. Hawkins, B. McArdle, T. S. Rodgers, A. B. Stokes.

DIPLOMA IN ANAESTHETICS.—G. F. V. Anson, H. Charles, L. T. Clarke, Elsie C. Hanson, O. J. Murphy, L. M. Routh, S. T. Rowling, J. D. Stewart.

Medical News

The Duke of York will preside for the first time as president of King's College Hospital at the festival dinner at Claridge's on Thursday, November 14th, when His Royal Highness will announce the programme for the further development of the hospital.

The ninety-fourth half-yearly dinner of the Aberdeen University Club, London, will be held at the Café Royal on Thursday, November 21st, at 7.30 p.m., followed by dancing. Dr. J. M. Bulloch will preside, and General Sir Ian Hamilton will be the principal guest. The honorary secretary's address is 16, Tregunter Road, S.W.10.

The British College of Obstetricians and Gynaecologists will hold a dinner on Friday, November 15th, at Claridge's, Brook Street, W., with the president (Dr. J. S. Fairbairn) in the chair.

Three Cantor lectures, on Geological Aspects of Underground Water Supplies, will be given by Dr. Bernard Smith, F.R.S., on November 18th, November 25th, and December 2nd at 8 p.m., at the Royal Society of Arts, John Street, Adelphi, W.C.2.

A meeting of the Pharmaceutical Society of Great Britain will be held at 17, Bloomsbury Square, W.C., on Tuesday, November 12th, at 8.30 p.m., when Professor Arthur Smithells, F.R.S., will receive the Harrison Memorial Medal and deliver the Harrison Memorial Lecture, on "The Teaching of Chemistry." Professor Smithells was chief chemical adviser (anti-gas training) G.H.Q. Home Forces 1916–19, and was closely associated with Colonel E. F. Harrison, director of chemical warfare, in anti-gas work.

A meeting of the Medical Officers of Schools Association will be held at 11, Chandos Street, W., on Friday, November 15th, at 5 p.m., when Mr. E. Wilson Hall will read a paper on "Some Problems of the Medical Officer in Private Preparatory Schools." A discussion will follow.

A sessional meeting of the Royal Sanitary Institute will be held in Leamington Spa Town Hall, on Friday, November 15th, at 4.45 p.m., when there will be a discussion on "Medicine at Health Resorts," to be opened by Dr. Frank Clayton.

Dr. R. J. Lythgoe will read a paper on "Visual Perceptions Under Modern Conditions" before the Illuminating Engineering Society at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W., on Tuesday, November 12th, at 7 p.m.

Two lectures for school medical officers, on the diagnosis of congenital syphilis, will be given by Dr. D. Nabarro at the Hospital for Sick Children, Great Ormond Street, W.C., on Monday and Tuesday, November 18th and 19th. The lectures, the fee for which is £1 1s., will be illustrated by lantern slides and specimens, and a series of cases will be shown. They start at 2.30 p.m. and, with the demonstrations, will continue until 4 p.m.

The Fellowship of Medicine (1, Wimpole Street, W.) announces that a debate on the motion "That the Present Rate of Maternal Mortality is a Discredit to Modern Obstetrics" will be held at the Royal Society of Medicine (1, Wimpole Street, W.) on November 13th, at 8.30 p.m., when Dr. T. Watts Eden will occupy the chair. Dame Janet Campbell and Professor J. M. Munro Kerr will propose the motion, which will be opposed by Professor Gilbert Strachan and Professor Daniel Dougal. The debate will then be thrown open for discussion. All members of the medical profession are invited to be present. A course in medicine, surgery, and gynaecology will be held at Royal Waterloo Hospital from November 11th to 23rd. Other courses include: venereal disease, at London Lock Hospital, November 18th to December 14th; infants' diseases at Infants Hospital, November 25th to December 7th; proctology, at St. Mark's Hospital, November 25th to 30th; dermatology, at Hospital for Diseases of the Skin, Blackfriars, S.E., November 25th to December 7th; chest diseases, at Brompton Hospital, November 30th and December 1st; and an evening clinical and pathological course for M.R.C.P. candidates, at National Temperance Hospital, Tuesday and Thursday evenings, at 8 p.m., from November 26th to December 12th. Full information regarding the courses may be obtained from the Fellowship of Medicine.

The twenty-second French Congress of Hygiene was held on October 21st, 22nd, and 23rd at the Pasteur Institute under the presidency of Professor Lereboullet, who is President of the Société de Médecine Publique et de Génie Sanitaine. This year the congress was devoted to infant welfare.

Further information has now been received about the Physio-Therapeutic Congress, to be held at Kharkov from December 19th to 25th. The proceedings will consist mainly of short papers lasting about twenty or thirty minutes, with some shorter ones, and covering the technique and application of the varieties of physical medicine. Attention will be devoted to the latest reports about the physiological effects, and the many forms of treatment available in Soviet Russia will be detailed. Consideration will also be given to ultra-violet and short-wave therapy. A full list of speakers and subjects, and information concerning travel facilities and hotel accommodation, may be obtained from Intourist Ltd., Bush House, London.

The issue of *La Medicina Ibera* for October 5th contains an illustrated account of the proceedings of the International Congress of the History of Medicine held in September at Madrid.

Professor Pietro Rondoni has been nominated director-general of the Victor Emmanuel III Institute for the Study and Treatment of Cancer, in succession to the late Professor Gaetano Fichera.

The King has granted authority to Dr. William Dunlop, O.B.E., and Mr. Gordon Stewart Woodman to wear the Insignia of the Fourth Class (Civil Division) of the Order of Al Rafidain, conferred upon them by the King of Iraq in recognition of valuable services rendered while employed by the Iraqi Government.

Cancer has recently been made a notifiable disease in Jugoslavia on the demand of the Jugoslavia Society for the Campaign against Cancer.

The late Professor Ramón y Cajal has left a legacy of 25,000 pesetas to found a prize to be awarded by the Spanish Academy of Medicine for the best work on a subject to be settled by that body.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1. on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

The **TELEGRAPHIC ADDRESSES** are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Pre-natal Quinine

Dr. N. R. DHARMAVIR (Lahore) writes: Though not in general practice for the last eight or nine years, I have been keenly interested for quite another reason in the articles appearing from time to time in the *British Medical Journal* on "pre-natal quininization." In the course of my general practice in England, extending over a period of twenty-six years in the counties where the women, young and old, work as weavers, etc., I quite early formed the opinion that quinine was a uterine neuromuscular tonic, and in menstrual disturbances—for example, amenorrhoea, menorrhagia, dysmenorrhoea, etc., unaccompanied by any grave disorder—I used to prescribe a three-months course of 2 grains of tab. quin. sulph. b.d.s., and in the event of idiosyncrasy (which I found quite common), 1 grain, b.d.s. The result was that besides improvement in general the menses appeared at regular intervals, excessive menstruation became more normal, painful menstruation became painless, and many menopausal nervous manifestations disappeared. So successful, in fact, did I find this treatment that failure was a rare occurrence. I have not found any reference to this treatment anywhere, and was, moreover, once hauled up by the Lancashire Insurance Committee to give an explanation of my excessive use of quinine for panel patients. I should be interested to know if Dr. D. A. Mitchell or any other gynaecologist has used quinine for menstrual disorders, and, if so, with what result.

Aphonia

Dr. N. S. SETTEN (Arbroath) writes: Dr. John Donald, in your issue of October 26th, writes regarding a case of aphonia and requests a prognosis. I have a case with a similar history of about one year's duration. Two years ago the voice became a whisper following an attack of bronchitis; after some weeks, as the patient became stronger, the

voice was completely restored. Then in January of this year she contracted another attack of bronchitis, after recovery from which she has only been able to whisper. An *x*-ray examination of the chest revealed some thickening at the hilum of the left lung, and it was concluded that the left recurrent nerve was caught in this mass, leading to paralysis of the left cord. Various treatments have been tried: diathermy, faradism, etc., none of which have influenced the condition. I have come to the conclusion that the longer the condition remains the worse is the prognosis.

Income Tax

British Income of Foreign Resident

"PAOLINA" asks what rebate is allowed to a married man with an income of £800 per annum from British industrial shares who is living permanently abroad.

*** He is entitled, under Section 24 of the Finance Act, 1924, if he is a British subject, or was resident in the United Kingdom and is residing abroad for health reasons, to the same allowances as if he were residing here, subject to the proviso that foreign income not chargeable to tax shall be taken into account so as to restrict the allowances proportionately. The exemption which "Paolina" has in mind does not apply to income from British industrial shares, but to foreign income—for example, a colonial pension—and to interest on some Government loans—for example, the 3½ per cent. War Loan—issued with the condition that the interest shall not be liable to tax if it is in the beneficial ownership of persons not ordinarily resident in the United Kingdom.

LETTERS, NOTES, ETC.

Diphtheria: Two Questions

Dr. A. R. EATES writes from Acton, W.: It is only your very emphatic "Ten per cent. do *not* remain Schick-positive if the prophylaxis is properly carried out," that brings me once more to your portals begging for a little space in which to state publicly where I stand, and why I stand there. I have no desire to increase the difficulties of others; I seek to minimize my own. In what follows I quote from the *Epitome* published with the *Journal*, and from the *Journal* itself, and for brevity I state the dates only: December 2nd, 1933, M. Fayot states that "diphtheria in the inoculated occurs in about 3.3 per cent. of all the cases of diphtheria observed in France, and has been noted in 11.6 per cent. of the cases at the Hôpital des Enfants Malades in Paris in recent years." And "the mortality was 11 per cent. as compared with *4.8 per cent. in the inoculated*" (italics mine). March 11th, 1933, Tomcsik reports the after-histories of 100,000 children who were immunized three times with diphtheria toxoid. The morbidity amongst the immunized cases was 10 per cent. of the *expected* (italics mine) morbidity in the control group. September 14th, 1935, "Within five months of the inoculations Schick tests were performed on 359 cases, and 225 (62.6 per cent.) were found to be immune"—that is, 37.4 per cent. were not immune. Lastly, I would point to your notice of the Chief M.O.H.'s report, from which, under "Epidemiology," you extract these figures for diphtheria:

Year	Cases Notified	Death Rate
1933	47,435	5.5 per cent.
1934	68,759	5.9 " "

The increase was 21,324, keeping pace, it would appear, with the increase in immunizings. The death rate up also. I cannot think that observers in China and France and Austria are ignorant of the proper technique. The money question, with your kind permission, I will drop for the present, so as to simplify the issue. In the meantime I must say I am "perplexed in the extreme" by all the contradictions I meet daily.

Haematemesis in Infancy

Dr. J. S. COLEMAN (assistant resident medical officer, Forest Gate Hospital, E.7) writes: I was much interested in Dr. R. Force-Jones's description of his case of haematemesis in infancy (October 19th, p. 770). I recently had a case presenting several similar features which was successfully treated by whole-blood injection, employing the mother's blood. A primipara, aged 25, gave birth normally on July 18th to an apparently healthy male infant weighing 6 lb. The child was put to the breast and sucked vigorously. On July 20th, at 1.30 a.m., he vomited suddenly a small quantity of bright red blood, and passed a large quantity of dark, altered blood per rectum on to his napkins. During the morning he continued to vomit bright red blood in larger amounts, and his stools showed much dark, altered blood. The child was now pale and collapsed, and I feared he would not survive any further haematemesis. At 12 noon I withdrew 10 c.cm. of blood from the median basilic vein in the mother's arm, and injected the whole blood intramuscularly into the gluteal region of the infant. The effect was most dramatic. The vomiting of blood ceased and the stools were blood-stained only up to 8 a.m. on the 21st, after which they rapidly returned to normal. Slight vomiting of breast milk was noted the same day, but I attributed this in part to the "vomiting habit" already established. On the 22nd slight jaundice appeared; he vomited a little breast milk after one feed and the stools were normal. A little occasional vomiting after breast feeds occurred up to the 26th, from which date nothing further of abnormal character was noted. The jaundice was in no way different from the "physiological jaundice" observed in many newborn infants. I did not notice any abdominal tenderness, but distension was present, as recorded by Dr. Force-Jones in his case. The mother, whose breasts and nipples had been perfectly normal during the period of observation, and babe were discharged from hospital on July 29th: the infant weighed 5 lb. 10 oz., and was taking the breast well. I had a similar case about three years ago, which terminated fatally on the medicinal treatment recommended by Goodhart and Still. I think the haematuria is a point against the diagnosis of gastric ulcer, and would favour the view that the condition is due to an inborn lack of certain "bodies" in the epithelial lining of stomach and kidneys which normally prevent the transudation of blood through these epithelial structures at the critical period shortly after birth, when the rapid increase of the rate of the blood flow to these organs must occur to adapt them to their respective physiological functions. These bodies may be present in adult blood in large quantities, and the infant's deficiency can be rapidly made good either by direct blood transfusion, which requires considerable surgical dexterity, or by the method of whole-blood injection described in this case.

Aids to Hearing

The National Institute for the Deaf has recently issued an eight-page booklet entitled "The Choice of a Hearing Aid" (for the information of the deaf). Approved by the Hearing Committee of the Medical Research Council and the Institute's own medical committee, this pamphlet has the excellent object of advising the deaf in the purchase of instrumental aids to hearing and warning them against exploitation by firms whose business methods are unfair. It is well recognized that money is often lost by the uninitiated, and many whose hearing could be greatly improved by the choice of a correct aid are discouraged from pursuing their problems further. The booklet, which is quite short, explains in simple language the causes of deafness and the various means available for aiding it, and gives advice on purchase of apparatus. The reader is strongly urged to insist on trial of the apparatus before purchase, and in this connexion the booklet mentions certain firms (the present list, which is obtainable from the N.I.D., amounts to twenty-six) which allow an extended home trial subject to the payment of 5 per cent. of the value of the instrument. The booklet can be obtained at the headquarters of the Institute, 105, Gower Street, W.C.1 (price 3d.).

Corrigendum

In the obituary notice last week relating to Dr. Ian D. Suttie, Kenlaw private asylum should have been designated Kenlaw private hospital for functional nervous diseases.

H. K. Lewis and Co., Ltd. (136, Gower Street, London, W.C.1) inform us that they can supply copies of *Clinical Tuberculosis*, by Benjamin Goldberg (2 vols., 92s. net) and *Halfway to the Hereafter*, by Ethel Turner Stoneman (5s. net), reviews of which appeared on November 2nd, pp. 841 and 843 respectively.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 51, 52, 53, 54, 55, 58, and 59 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 56 and 57.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 216.